

DRAFT REPORT FOR REVIEW

REVIEW OF SELECTED INDUSTRIAL ENVIRONMENTAL INITIATIVES
OF THE UNITED NATIONS SYSTEM AND REGIONAL BANKS

Issue paper for the United Nations Environmental Management Group

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1. Introduction

1.1. Request for the issue paper

The Environmental Management Group (EMG) was established to enhance UN system-wide inter-agency coordination related to specific issues in the field of environment and human settlements. EMG adopts a problem solving, issue-management approach, to enable the formulation of effective, coherent and coordinated UN system responses to specific environment and human settlements challenges.

At the tenth session of the EMG on 8 February 2005, the Commission on Sustainable Development (CSD) Secretariat/United Nations Department of Economic and Social Affairs invited EMG to prepare two issue papers, on air pollution/atmosphere and on industrial environmental management. The issue papers should provide an integrated contribution from EMG members in terms of their experiences, lessons learned and best practices on specific environmental aspects of those issues. EMG agreed to prepare these two issue papers with the International Maritime Organization taking the lead for the preparation of the issue paper on air pollution/atmosphere and the United Nations Industrial Development Organization (UNIDO) taking the lead for the preparation of the issue paper on industrial environmental management.

Subsequently, EMG recruited an external expert to write the issue paper and requested EMG members to prepare case studies on one or more of their initiatives for inclusion in the report. Each case study was to address seven issues: the problem; the response; major outcomes; factors for success; challenges; sustainability; and transferability; it should also include key references for additional information on the

initiative. In addition, EMG members were requested to assign first priority in their selection of a case study to initiatives undertaken by two or more UN agencies/regional development banks in order to show the potential and limitations of coordination.

The first inquiry by the external expert for collaborative capacity building initiatives by two or more UN agencies/regional development banks revealed that there are only three in existence: phase out of ozone-depleting substances (ODS) by the Multilateral Fund for the Implementation of the Montreal Protocol (MLF); national implementation plans by the Stockholm Convention; and (UNIDO)/United Nations Environment Programme (UNEP) national cleaner production centres. Consequently, EMG decided that the issue paper should be a combination of case studies on those efforts to the extent possible and on several other efforts undertaken by just one United Nations agency/regional development bank in order for the issue paper to reflect the wide range of experience in supporting industrial environmental management in developing countries. Also they decided that the case studies should include examples of financial support for reducing pollutants as well as those whose primary aim was capacity building due to the fact that financial support from developed countries is considered essential by developing countries.

1.2. Aim of the issue paper

This issue paper builds on the wide array and diversity of initiatives that the UN system/regional development banks have undertaken to improve industrial environmental management in developing countries. No attempt has been made to describe all of these initiatives in detail. This issue paper rather focuses on representative examples of the support provided for improving the environmental performance of the industrial sector in

developing countries. The selected initiatives were suppose to present information on the basis of which lessons learned could be identified and compared and thus provide an additional basis for the formulation of effective, coherent and coordinated UN system/regional development bank responses to the need for improving the environmental performance in developing countries.

1.3. Definitions of key terms and concepts

This section provides definitions for several key concepts and problematic terms used in the issue paper in order to ensure that readers properly understand them. These are industry, United Nations system, capacity development and industrial environmental management.

Industry

The words industry and manufacturing are often used interchangeably in writing reports on and discussions about industry, which can be confusing. In the United Nations system and in many countries, industry is specifically defined as comprising mining, manufacturing, construction, electricity, water and gas (ISIC 10-45). Manufacturing refers to industries that belong only to ISIC divisions 15-37 (World Bank, 2004). In this issue paper, the words industry and manufacturing are used interchangeably, but always in the sense that they refer exclusively to the manufacturing sector.

Capacity building

The United Nations Inter-Agency Workshop on Capacity Development in November 2002 concluded that the term *capacity development* reflects the fact that capacity is always available and its development is a matter of degree as well as a

primarily endogenous process. *Capacity building* on the other hand implies that capacity is newly created. While the understanding of capacity development as an ongoing endogenous process has taken root throughout the United Nations system, different actors within and outside the system have become accustomed to using either one of the terms to refer to this same process. For practical reasons, this report will use the term capacity building, being fully aware of using a term with the above-mentioned conventional limitations.

United Nations system

The United Nations system refers to all organizations within the United Nations proper, including specialized agencies and several programmes and bodies. The issue paper includes initiatives by organizations within the United Nations system as well as other international organizations that are concerned with the environmental performance of industry in developing countries. These other organizations include regional development banks and transnational organizations associated with the United Nations system.¹

Industrial environmental management

Industrial environmental management is defined as a continuous process that consists of three interrelated steps: (1) problem definition that requires collecting and analysing data on industrial pollutant releases; (2) programme response to reduce the release of industrial pollutants; and (3) periodic verification through independent auditing.

¹ Transnational organizations are non-state actors that appear to resemble international regimes with the important difference that it is not states but non-state actors who generate both the principles, norms, rules and decision-making procedures and the expectations associated with them (Dingwerth, 2005).

Whereas the activities that constitute problem definition and periodic verification are relatively straightforward and will be discussed in the concluding section of the issue paper, the measures that constitute programme response are more diverse and thus require further elaboration. Programme response consists primarily of various measures undertaken to alter the behaviour of industrial polluters. It is most often equated with regulation as defined by the OECD (1997):

“Regulations can include both formal legal instruments and more informal instruments, such as guidance, that are issued by all levels of government. ‘Regulation’ in this work can also include rules issued by non-governmental bodies, such as self-regulatory bodies, to whom governments have delegated regulatory powers.”

The various instruments for industrial environmental management are often grouped into one of four direct approaches: (1) command and control; (2) economic/fiscal incentives; (3) voluntary actions; and (4) transparency and disclosure. Most of the instruments that fall into these four direct categories are noted in Table 1. In addition to these direct approaches that can alter the behaviour of industrial polluters, governments can indirectly alter the behaviour of industrial polluters by integrating environmental considerations into industrial development policies that include industrial promotion, trade and technology policies. These policies include those that influence the scale, sub-sector composition, technological configuration and location of industrial growth (EC, 1990 and OECD, 1997).

Table 1. Industrial environmental management instruments

<p><u>Command and control standards for</u></p> <p>Residuals released into the environment Material used in production Technologies used in production Goods produced Location of production</p>	<p><u>Economic</u></p> <p>Charges and taxes Grants and subsidies Fines for non-compliance Tradable permits</p>
<p><u>Voluntary</u></p> <p>Cleaner production programmes Environmental management systems Product labelling Industry codes of practice</p>	<p><u>Transparency and disclosure</u></p> <p>Toxic release inventory Corporate reporting Corporate environmental performance awards</p>

1.4. Information made available

Eight case studies were submitted by the various agencies of the United Nations system and regional development banks as background material for the issue paper. The case studies primarily describe programmes supportive of governmental efforts to improve the environmental performance of industry. The case studies were classified by the expert based on their institutional support for one of the four direct approaches to industrial environmental management. . Classification was difficult because some of the programmes described by the case studies supported the use of more than one direct approach. For example, the World Bank industrial pollution prevention and control programme in India enhanced institutional capacity for command and control regulation, supported the use of economic instruments (subsidies and charges) and provided technical assistance for one voluntary approach (cleaner production labelled as waste minimization). In spite of the difficulty of classification, the expert classified the case to provide the reader with an overview of the different types of programmatic support for

national governmental efforts. To some extent, the expert was then able to use the classification to focus the content of the case studies. The classification of case studies is given in Table 2 by abbreviated organizational sponsors and programme names in bold.

Also, the expert wrote summaries of additional programmes of the United Nations system and regional development banks to the extent that time was available in order to provide a more comprehensive picture of the diversity of the efforts that have been undertaken by the United Nations system and regional banks. While the programme summaries are only brief notes attached to the issue paper as an annex, they offer some insights on programme design for those interested in reading them. These programme summaries were also classified by the expert based on their primary focus on one of the four direct approaches or the one indirect approach to industrial environmental management. The classification of programme descriptions is given in Table 2 by abbreviated organizational sponsors and programme names in italics.

Table 2. Industrial environmental management: Problem characterization, programme response and periodic response

STEP 1		PROBLEM CHARACTERIZATION						
		pollutants					resources	
		Conventional pollutants			Global pollutants		Energy	Water
		Continuous release	Emergency release	GHG	ODS	POPS		
		WB/estimated BOD		IEA UNFCC	Ozone Sec	SC	IEA	FAO
STEP 2		PROGRAMME RESPONSE						
Direct	Command & control regulation	WB/IPPC <i>WB/MEIP</i> <i>UNIDO/AEQM</i>						
	Economic incentives	UNIDO/LSPC		GEF CDM	MFS/MF GEF	<i>GEF</i>		
	Voluntary actions	UNIDO/UNEP/NCPC ADB/CPTAL UNEP/GRI <i>UN/GLOBAL COMPACT</i> <i>IADB/EMS</i> <i>IFC/EQUATOR</i>	UNEP/APELL					
	Disclosure	WB/PROPER						
Indirect	Industrial policy	<i>UNIDO/SID</i>						
	Industrial estates							
STEP 3		PERIODIC VERIFICATION						
Peer review								

- | | | | |
|-------|---|--------|---|
| ADB | Asian Development Bank | GHG | Greenhouse Gas |
| APELL | Awareness and Preparedness for Emergencies at Local Level | GRI | Global Reporting Initiative |
| AEQM | Area-wide Environment Quality Management | LSPC | Leather Sector Pollution Control |
| BOD | Biochemical oxygen demand | MEIP | Metropolitan Environmental Improvement Program |
| CDM | Clean Development Mechanism | MF | Multilateral Fund |
| CETP | Central Effluent Treatment Plant | MFS | Multilateral Fund Secretariat |
| CPTAL | Cleaner Production Technical Assistance and Loan | ODS | Ozone-depleting substances |
| EMS | Environmental Management Systems | POPS | Persistent Organic Pollutants |
| IADB | Inter-American Development Bank | PROPER | Programme for Pollution Control, Evaluation, and Rating |
| IEA | International Energy Agency | SC | Stockholm Convention Secretariat |
| IPPC | Industrial Pollution Prevention and Control | SID | Sustainable Industrial Development |
| IFC | International Finance Corporation | UNIDO | United Nations Industrial Development Organization |
| FAO | Food and Agriculture Organization of the United Nations | UNEP | United Nations Environment Programme |
| GEF | Global Environment Facility | UNFCC | United Nations Framework Convention on Climate Change |

1.5. Scope of the issue paper

Beyond the introduction, the issue paper consists of four sections. In section two, internally consistent global data collected or estimated by the United Nations system on resource use and pollutant loadings from the industrial sector are used to make the case for why additional efforts on the part of the UN system and regional banks are needed to improve industrial environmental management in developing countries. These data compare resource use and pollutant intensities between industrialized and developing countries circa 1992, the date of the United Nations Conference on Environment and Development (UNCED) and in 2002, the date of the World Summit on Sustainable Development (WSSD). In section three, the eight case studies that address the seven points stated in section 1.1 are presented and in section four major observations extracted by the expert from the case studies are put forward for the purpose of generating discussion among the reviewers of the issue paper. In section five, some general issues are raised about the overall approach of the UN system and regional development banks. In annex 1, the programme summaries are presented and in annex 2 brief statements about the industrial environmental management programmes of those organizations submitting case studies.

2. Eco-intensity comparisons, circa 1990-2002

2.1. Methodology

This section is a comparison of the trends in resource use and pollutant-loading intensities over a 13-year period for four country groups, namely industrial, transitional, developing and least developed countries. It begins with a description of eco-intensity and data availability. From there it moves to an analysis of global trends in eco-intensity for energy use, water use, organic matter effluent, and carbon dioxide emissions (CO₂) to

show the current differences in industrial environmental performance among the four country groups.

2.1.1. Eco-intensity indicator

The numerator of an eco-intensity indicator can be both inputs into the production process (environmental withdrawals) and non-product outputs (environmental releases). Environmental withdrawals can be disaggregated into five categories (use of energy, use of water, use of other natural resources, use of recycled material and land use); in the issue paper only two categories, use of energy and water by the manufacturing sector, are examined due to data limitations. Environmental releases can be disaggregated into two categories, pollutant release (air and water) and waste disposal/by-products; only two types of pollutant release, organic matter and CO₂ are taken into account in the issue paper, again due to data limitations.

The denominator of an eco-intensity indicator can be either an economic measure or population size. The denominator used for this analysis is manufacturing value added (MVA) at constant prices. MVA data are available from UNIDO (2005).

2.1.2 Data availability for estimation of eco-intensity indicators

In undertaking the analysis for the issue paper, a search was undertaken by the expert for internally consistent global data on the industrial sector's environmental withdrawals and releases. While manufacturing related environmental data are relatively robust even though limited for most industrialized countries, this is different in the case of developing countries. In the latter case, the data are fragmented and of uneven quality as there is no international organization that undertakes a comprehensive and systematic collection and vetting of resource use and pollutant release data for the manufacturing sector in developing countries. The United Nations Environment Programme (UNEP)

focuses its efforts primarily on assembling ambient environmental quality data and not their precursors, pollutant releases that affect environmental quality (UNEP, 2002).

However, energy use and associated carbon dioxide (CO₂) emissions collected by the International Energy Agency (IEA), organic matter effluent estimated by the World Bank (WB) and water withdrawal data collected by the Food and Agricultural Organization (FAO) help to construct a more accurate composite.

In addition, there exists data on the consumption and production of ODS published by UNEP (UNEP, 2005) and there will soon exist data on the release of persistent organic pollutants, which is currently being assembled by the Stockholm Convention Secretariat. The ODS were not used in this report, however, because MVA data for the specific manufacturing sectors actually consuming and producing ODS were not available. Without these data it is not possible to calculate an intensity indicator.

Energy use (consumption) data for the manufacturing sector are available from the annual energy statistics reports published by the IEA. IEA compiles national data submitted to it on consumption of fuels by fuel product type for the manufacturing sector and selected sub-sectors. Aggregated energy use of the manufacturing sector is measured in terms of terajoules or tons of oil equivalents (toe) (IEA, 2005).

Water use (withdrawal) data for the manufacturing sector are available from FAO's AQUASTAT, a global information system of water and agriculture. While the main focus of AQUASTAT is agriculture-related water data, it also contains estimates of freshwater withdrawals by industry based on total renewable water withdrawal reported by 153 countries for various years. FAO allocates water withdrawals to three sectors (agriculture, domestic and industry) based on a 1987 allocation. Industrial freshwater withdrawal includes cooling water from thermoelectric plants (FAO, 2005).

CO₂ emission data are available both from IEA and the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat. While the IEA estimates and the inventories submitted to the UNFCCC for CO₂ emissions are reasonably similar for industrial countries, there are significant data differences between the two for developing countries (IEA, 2005). In this analysis, IEA data are used because their coverage is more detailed for the manufacturing sector. IEA estimates CO₂ emissions by applying carbon emission factors to the total consumption of fuels by fuel type (IEA, 2005). IEA also uses the carbon emission factors for energy consumption and industrial processes recommended by the Intergovernmental Panel on Climate Change (UNEP, 1995).

Data on organic water effluent loadings are available online from the World Bank's *World Development Indicators* (WDI). The loadings are reported as biochemical oxygen demand (BOD), which refers to the amount of oxygen that bacteria will consume in breaking down waste. The estimated BOD effluent in the WDI comes from an international study of manufacturing effluents from 13 countries (Hettige, Mani and Wheeler, 2000). Their econometric analysis of the plant and sub-sector level data from these 13 countries found that the ratio of BOD to employee for each industrial sub-sector is about the same across all countries. They multiplied the estimated BOD effluent per employee by UNIDO sub-sector employment estimates to generate sub-sector effluent discharge by country. The most recent data available in the WDI are based on updating the original estimates through 2001, providing yearly BOD pollutant loadings data for the period 1980 to 2001 (World Bank, 2004).

2.1.3 Limitations of the analysis

The analysis offered in the issue paper regarding global trends in resource use and pollutant-loading intensities examines only two resource inputs and two pollutant

variables. Clearly, there are many more variables that should be taken into account. However, two recent analyses done for industrialized countries also suffer from the same problem. An analysis of industrial resource use and pollutant-loading intensities in OECD countries included water use for a few countries only and no water pollutant variables in general (OECD, 2002). A similar analysis for industry in EU countries also did not include water use and water pollutants because of data limitations (EC, 2002). Hence, data limitations are a pervasive problem for all countries in spite of the great concern expressed by global leaders about water use and pollution.

2.2. Comparisons among country groups

This sub-section presents estimates of eco-intensity for four variables, namely energy consumption, water withdrawal, BOD effluent and CO₂ emissions for the manufacturing sector. In making the calculations for the analysis, data from all countries for which there were reported or calculated data were used. The calculations were done for four country groups, namely industrialized countries (IC), transition economies (TE), developing countries (DC) and least developed countries (LDC).

2.2.1. Energy-use intensity

Changes in the level of energy-use intensity as measured in toe per million US dollars of MVA are presented by country groups in Table 3. Energy-use intensity decreased (energy efficiency increased) in all of the four country groups between 1990 and 2002. Most remarkable was the decrease in energy-use intensity in the TE country group. As of 2002, energy efficiency in the IC country group was more than three times that of the DC group.

Table 3. Energy-use intensity by country groups, 1990- 2002

Country Groups (number of countries/total number in the group)	1990 (toe/10 ⁶ US\$ of MVA)	2002 (toe/10 ⁶ US\$ of MVA)
Industrialized Countries (25/25)	200	190
Transition Economies (7/22)	1380	580
Developing Countries (53/100)	780	590
Least Developed Countries (8/45)	700	640

Sources: IEA (2005) for energy use and UNIDO (2005) for MVA

2.2.2. Water-use intensity

Changes in water-use intensity, as measured in cubic meters of water withdrawal per million US dollars of MVA, are presented by country groups in Table 4. Water-use intensity decreased in two country groups (IC and LDC) and increased in the other two country groups (TE and DC). As of 2000, there was comparatively low water-use intensity (i.e. high efficiency of water use) in LDCs and ICs, comparatively high (i.e. low efficiency of water use) in DCs and very high in TEs.

Table 4. Water-use intensity by country groups, 1990- 2000

Country groups (number of countries/total number in the group)	1990 (m ³ /10 ⁶ US\$ of MVA)	2000 (m ³ /10 ⁶ US\$ of MVA)
Industrialized Countries (7/25)	25 200	21 600
Transition Economies (13/22)	356 800	684 100
Developing Countries (37/100)	188 100	246 100
Least Developed Countries (7/45)	96 700	85 600

Sources: FAO Aquastat for Water Use (2005) and UNIDO (2005) for MVA.

2.2.3. BOD-effluent intensity

Changes in water pollutant intensity as measured as tons of BOD effluent per million US dollars of MVA are presented in Table 5. BOD intensity decreased in all four country groups. Most remarkable was the decrease in BOD intensity in the DC group, which suggests poor quality data rather than actual reduction in BOD loadings. In 2001 BOD intensity was lowest in the IC group, followed by the DC group. The LDC group,

even though its BOD-intensity was less intensive in 2001 than in 1990, had a BOD intensity of almost four times as high as the DC group.

Table 5. BOD-effluent intensity by country groups, 1990- 2001

Country Groups (number of countries/total number in the group)	1990 (tons/10 ⁶ US\$ of MVA)	2001 (tons/10 ⁶ US\$ of MVA)
Industrialized Countries (24/25)	1	0.5
Transition Economies (10/22)	7	5
Developing Countries (57/100)	6	3
Least Developed Countries (14/45)	15	10

Sources: World Bank (2004) for BOD and UNIDO (2005) for MVA

2.2.4. CO₂- emission intensity

Changes in CO₂-emission intensity, as measured in tons of CO₂ emissions per million US dollars of MVA, are presented in Table 6. CO₂-emission intensity decreased in all four country groups, but barely so for the LDC country group. Most remarkable was the decrease in CO₂-emission intensity in the TE group. In 2002, CO₂-emission intensity among the four country groups still differed by a factor of four; it was lowest in the IC group and highest in the LDC group.

Table 6. CO₂-emission intensity by country groups, 1990- 2002

Country groups (number of countries/total number in the group)	1990 (tons/10 ⁶ US\$ of MVA)	2002(tons/10 ⁶ US\$ of MVA)
Industrialized Countries (25/25)	420	310
Transition Economies (7/22)	3260	1270
Developing Countries (57/100)	2120	1290
Least Developed Countries (12/45)	1470	1330

Sources: IEA (2005) for CO₂ emissions and UNIDO (2005) for MVA.

2.2.5. Summary

Globally there exists consistent data for which one can analyse trends in and current levels of eco-intensity for four environmental parameters, namely energy use, water use, BOD effluent and CO₂ emissions. For the most part, the eco-intensity trends showed a decrease for all four country groups for three variables and for two of the four country groups for one variable (water use). Of greater relevance for the issue paper, is a comparison of the current status of eco-intensity among the four country groups for the four variables. A comparison between IC and DC groups shows that energy-use intensity is three times higher, water-use intensity is ten times higher, BOD-effluent intensity is six times higher and CO₂-emission intensity is over four times higher in the DC group. A comparison between IC and LDC groups shows even more extreme differences except in the case of water-use intensity. In spite of the reductions in eco-intensity in the DC and LDC groups between 1990 and 2002, their current eco-intensities compared to the IC groups show clearly more must to be done to de-link environmental pressure from the growth of manufacturing output in DCs and LDCs groups.

3. Case Studies

3.1. Command and control regulation—Industrial Pollution Prevention and Control (IPPC) in India — World Bank

3.1.1. The problem

By the late 1980s, industrial pollution in India already constituted a major concern and a threat to the sustainability of economic development of the country. At the time, the Indian Ministry of Environment and Forests (MOEF) had estimated that, although

comparatively smaller in volume than municipal discharges, industrial sources of pollution contributed about one third of all pollution load into rivers and waterways, placing unsustainable burdens on the quality of rivers and aquifers. Industry was also identified as a major contributor to the deteriorating air quality in major urban areas and industrial centres, including cities such as Lucknow, Delhi and Mumbai.

In particular, many small and medium size-enterprises (SMEs) were found to be in continuous violation of environmental codes due to inefficient or inoperative controls and in the case of small plants, out of sheer inability to meet the financial and technical requirements associated with modern low pollution alternatives. The disposal and treatment of toxic and hazardous materials were of particular concern, given their large health and environmental costs. The inability of State Pollution Control Boards (SPCBs) to monitor a diverse and complex range of pollution discharges further added to the enforcement problem.

3.1.2. The response

Starting in 1991, the Government of India, with technical and financial assistance provided by the World Bank, the Governments of Denmark, Norway, Japan and other parties, launched a comprehensive effort to address the root causes of industrial pollution in the country. The World Bank supported this effort with two projects. The first was the Industrial Pollution Control Project, a blended International Bank for Reconstruction and Development (IBRD) and International Development Association (IDA) loan for US\$155.6 million; the project was operational from 1991 to 1999. The second was the Industrial Pollution Prevention Project, also a blended IBRD and IDA loan for US\$168.0 million; this project was operational from 1996-2002. The design of these two projects drew on previous World Bank industrial pollution project experience in Brazil and Mexico.

The objective of both projects, which were an integral part of the environmental strategy of the country, was to prevent environmental degradation caused by industrial operations and assist in the attainment of medium term goals of India's industrial environmental policy. Both projects consisted of three components: (a) an institutional component designed to strengthen the Central Pollution Control Board (CPCB) and SPCBs of selected states; (b) an investment component via the Industrial Development Bank of India (IDBI) and the Industrial Credit and Investment Corporation of India (ICICI) to provide financial support for industry to comply with regulations, both for plant specific effluent treatment plants and common effluent treatment plants (CETPs) for clusters of SMEs and (c) a technical assistance component to prepare various technical reports, support an industrial extension service for promoting waste minimization (cleaner production) and assist development financial institutions in preparing feasibility and pre-investment studies.

The institutional capacity building component of the first project assisted four SPCBs, which were responsible for permitting, monitoring and enforcing standards set by the CPCB, in the states of Maharashtra, Tamil Nadu, Uttar Pradesh and Gujarat. Approximately 80 per cent of the industrial plants of the country were located in these four states in the early 1990s. The institutional capacity building component of the second project expanded the efforts already initiated at these four SPCBs and initiated new efforts at four additional states (Rajasthan, Madhya Pradesh, Karnataka and Andhra Pradesh).

3.1.3. Major outcomes

The two projects resulted in three major outcomes in line with the three project components: institutional strengthening, financing of pollution prevention and control investments and technical assistance. These outcomes are briefly described below.

The institutional component of both projects contributed to significant progress in the participating SPCBs in areas such as increased skills of the technical and scientific staff, streamlining and transparency of procedures, tighter internal controls, and the use of new technologies and analytical techniques to better understand environmental trends. The SPCBs revamped their laboratories, improved their monitoring and enforcement protocols and developed monitoring tools. At a wider scale, they significantly increased their effectiveness and are now seen as forcing industry to meet statutory requirements.

The investment component of the first project financed 64 pollution control schemes for a total cost of US\$500 million, with an average contribution of about 20 per cent of investment costs covered by a project loan. About two-thirds of the projects combined both cleaner technology and pollution control measures; the remaining one-third consisted almost exclusively of pollution control measures. The first project also provided financing for 53 CETPs. The investment component of the second project financed 12 pollution control schemes for a total cost of about US\$220 million, with an average contribution around 18 per cent. It also provided financing for two CETPs.

The technical assistance component of the first project supported and catalysed action by the CPCB to move from concentration based to load based standards and to strengthen the regulations dealing with the release of airborne pollutants. It also enhanced the capacity of two development finance institutions to prepare feasibility and pre-investment studies. The second project supported a waste minimization programme that established 115 waste minimization circles (WMC) covering 17 states and 41 industrial sub-sectors. It also financed several technical studies at the request of MOEF.

In summary, the joint results of both projects are better judged by the large number of activities financed (over 100), the strengthening of the institutional capacity at

the Boards and the emphasis on recycling, recovery and waste minimization as tools to address pollution from industrial sources.

3.1.4. Key factors for success

Many factors contributed to the success of this project. Some of the more important ones, like targeted support for a new Government programme, highly relevant services delivered to project beneficiaries, experience sharing and a lengthy period for project implementation, are described below.

First, both projects provided timely and targeted support for the Government policy statement for abatement of pollution issued in February 1992. Specific measures identified in this policy are: (a) pollution prevention [waste minimization]; (b) access to the best available practicable technical solutions; (c) increased effectiveness of regulatory activities to back up the adoption of the polluter pays principle; (d) focus on heavily polluted urban areas and river stretches; and (e) partial financing for CETPs and technical assistance services for SMEs. The projects assisted the Government in implementing these measures with their institutional support for SPCBs in states with a heavy concentration of industry; lines of credit for technology investments by single plants and construction of CEPTs to serve SMEs; and technical support for dissemination of waste minimization (pollution prevention) information and services.

Secondly, both projects provided services needed by various project beneficiaries. The enhanced monitoring and enforcement capacity of the SPCBs transformed the attitude of industrialists regarding the effectiveness of these organizations, ultimately leading to significant reductions in wastewater discharges. The increased awareness and capabilities at the development finance institutions allowed them to make secure loans for the mitigation of industrial pollution. This in turn resulted in these institutions securing

additional financial resources (notably from the Japanese Development Bank) to provide financing for industrial pollution control loans. At the industry level, the projects increased the recognition of the opportunities of waste recycling and recovery as a tool for pollution prevention. The organization and financing of CETPs at industrial estates enabled the SMEs to treat residues at much lower and affordable treatment costs rather than be subject to closure, which occurred in some cases.

Thirdly, the encouragement given by the project team and the MOEF for increased interaction and dialogue among the SPCBs resulted in an overall increase in the institutional capacity of SPCBs. As there were not sufficient project resources to provide support for all activities at all SPCBs, the successful introduction of an improvement in one SPCB, such as an online complaint registration, resulted in it being copied by other SPCBs.

Fourthly, the extended implementation period (1991-2002) for the two projects allowed for learning how to improve the services made available to project beneficiaries. For example, the CETPs financed by the second project were more comprehensive in scope compared to the CETPs financed under the first project. They included sludge management, waste minimization and effluent recycling/reuse, important aspects that had been missed in the design of earlier CETPs.

3.1.5. Challenges

Implementation of the projects encountered many problems, some of which were difficult to resolve. Some of these, in particular procedural constraints, financing for

cleaner technology investments by SMEs, information dissemination and coordination of donor funded lines of credit, are described below.

Firstly, while considerable institutional strengthening of SPCBs took place as a result of project activities, the degree of strengthening was constrained by state and central government procedures. A government-imposed hiring freeze since the early 1990s prevented the recruitment of new technical staff in the SPCBs. In some cases, government-imposed restrictions on public expenditure limited refurbishment of laboratories and the ability to monitor pollutant discharge in the field. Lastly, frequent turnover of top management in SPCBs slowed down implementation of managerial reforms.

Secondly, although WMC activities helped identify many pollution prevention options in SMEs, some of the more costly and promising options could not be financed because they were not eligible for financing under the credit lines funded by the project. Financing of such investments through the Small Industrial Development Bank of India, a sister organization of the IDBI could have helped considerably in this regard.

Thirdly, the dissemination of information and experiences was more difficult than anticipated at the inception of the project and thus was not as extensive as it might have been. There was need to institutionalise information sharing arrangements with all related environmental regulatory agencies both at the national and state level, whether they were part of the project or not, in order to maximize the effectiveness of technical assistance activities. There was also a need for more formal arrangements, such as workshops, websites and fact sheets for the dissemination of information on the cleaner technology measures funded by the project to industrial plants other than those that participated in the project.

Fourthly, different interest rates and transaction costs for loans between the two World Bank projects, as well as other donor funded lines of credit, resulted in confusion and overlap among the potential borrowers. Donor coordination or at least consultation to harmonize credit terms might have resulted in the more cost effective use of funds for pollutant reduction.

3.1.6. Sustainability of results

Given the rapid uptake of key institutional initiatives by the SPCBs, the overall sustainability of institutional capacity is likely. The project supported SPCBs appear to have internalised these initiatives to an extent that the risk of backsliding appears to be low even given the turnover of senior management, which represented a significant problem in the past. The financial position of the SPCBs also appears healthy, which provides an important cushion against year-to-year budget uncertainties and perhaps also some measure of insulation from political pressure. The key factor here is the law that entitles “cess” (water withdrawal tax) revenues and consent (licensing) fees to go directly to the SPCBs rather than passing through the general treasury.

As regards the two development finance institutions, they gained a significant level of expertise in marketing of environmental technology to industry. The senior management now recognizes that environmental loans as an important part of its business strategy. It is likely that this innovation will be noticed by other financial institutions and similar measures adopted, thereby increasing their long-term impact.

Lastly, as regards the WMC, the MOEF decided to continue financing of the programme under its own budget with a target of at least 500 WMC and has encouraged financial institutions such as the Small Industrial Bank of India to finance cleaner technology investments identified by the WMCs.

3.1.7. Transferability

Two initiatives undertaken by MOEF and supported by this project produced easily transferable results, i.e. the scheme of CETPs and WMCs. These initiatives have become models for pollution management in clusters of SMEs in other states in India and have been replicated in various countries. Many Asian countries, such as Bangladesh, Philippines, Sri Lanka, Thailand and Viet Nam have picked up the concept of CEPT. WMC and its success have also been discussed in several international conferences as a model to follow. Several countries, notably, Indonesia, Egypt, Nepal, Sri Lanka, South Africa and Thailand have taken lessons from the WMC programme. Today the concept has been dovetailed into the design and operation of UNIDO/UNEP National Cleaner Production Centres.

3.2. Economic Incentive—Leather Sector Pollution Control (LSPC)— UNIDO

3.2.1. The problem

Starting in the 1980s, the international community began observing with rising concern the increasing environmental damage caused by the growing leather processing sub-sector in many developing countries. Given its high environmental impact, especially on the utilization and degradation of land and water resources, the implementation of environmental protection measures by the leather industry became a UNIDO priority.

Back then, Asian nor African leather tanning industries, no matter how much pressure they faced from the public and/or the government, had institutions to assist them in addressing their environmental problems. Pollution control in the leather tanning industry is both technically difficult and costly for tanners. UNIDO decided to take up the challenge given its extensive technical assistance programme for leather and leather goods production.

In addition, the environmental management problems differed between these two regions and even more so within the regions. On the one hand, the industry in most of the countries in Asia working with the UNIDO leather programmes had smaller leather tanneries, weaker enforcement systems and less stringent customer requirements to reduce pollution. An exception was India, which had a strong institutional framework for environmental regulation and also exported a considerable proportion of its production, which required meeting high quality standards. On the other hand, the leather tanning industry in Africa was not as advanced as in India or Indonesia. The priority in Africa was therefore to help the leather-based industry to grow efficiently in the earlier stage of ensuring the quality of hides and skins as well as in the later stage of leather production.

3.2.2. The response

While UNIDO had already initiated its technical cooperation programme to improve productivity of the leather tanning industry in the 1970s, the environmental component only came into being in 1989 when a pilot effluent treatment plant (ETP) was created in the Brazilian State of Rio Grande do Sul to study various treatment technologies and to optimise processes for different leather processing methods. Since then UNIDO's programme has been increasingly concerned with assisting producers in optimising their technical capabilities to reduce pollution and in becoming more environmentally conscious.

UNIDO's umbrella project on pollution reduction for the Southeast Asian leather tanning industry was formulated in 1988 and began in 1992.² The programme was designed to implement pollution control measures and in-house improvements in the leather tanning industry through a suitable and comprehensive approach. This was done by so-called "Pilot and Demonstration Units" working with public sector industry-support

² The Southeast Asia programme included China, India, Indonesia, Nepal and Bangladesh.

bodies. Even though a cleaner production component was part of the programme from the beginning, the majority of the pilot units demonstrated end-of-pipe approaches, such as ETPs, sludge disposal etc. The demonstrations were reinforced by a number of guidelines, studies, recommendations etc., which enabled counterpart institutions to multiply the programme's results. Later, when the original number of demonstration sites was increased, the focus shifted towards cleaner technologies (CTs) over the entire production and waste treatment/disposal cycle. Most importantly, the demonstrations were implemented on a cost share basis with beneficiary enterprises rather than being showcased in a public sector research and development facility.

As mentioned earlier, the African leather programme faced different conditions and thus had a different approach to the industry.³ Although the first large programme in Africa, which started in 1992, focused on improving product quality and competitiveness, it also supported construction of ETPs too. In addition to establishing and supporting ETPs, as it early-on occurred in Kenya, Tanzania and Zimbabwe, the programme at a later date also promoted the use of CTs, such as hair savings and the recycling of chromium. The objective was to improve productivity of the tanneries, while at the same time reducing the negative environmental impacts of the tanning process by reducing waste at source.

Additionally, the programme supported the creation of national leather associations to increase the confidence and recognition of the leaders of the leather industry. This institutional support was later expanded to establish the Eastern and Southern Africa Leather Industries Association (ESALIA) in 1995, with its headquarters

³ The Eastern and Southern Africa programme included Ethiopia, Kenya, Malawi, Namibia Sudan, Tanzania, Uganda, Zambia and Zimbabwe.

in Nairobi. ESALIA is now pivotal in channelling the assistance from UNIDO, coordinating local activities, providing feedback, identifying technical cooperation needs and sustaining the various regional efforts.

3.2.3. Major outcomes

The Southeast Asian Programme effectively implemented pollution control measures and in-house improvements in leather tanneries. There was a visible increase in awareness relating to environmental matters in all countries, resulting in tanners being better prepared to react to and comply with customer requirements and government regulations.

This is most evident in India, where 150 out of the 400 tanneries closed by the Government resumed operation after either having installed their own ETPs or discharging their wastewater into common effluent treatment plants (CETPs). The programme significantly reduced pollution in the communities surrounding the tanneries. In Nepal, the achievements were similar, but not as extensive because the number of tanneries was significantly smaller. In Indonesia, the achievements remained more limited mostly due to the capacity constraints in the counterpart institution.

The programme in Eastern and Southern Africa was also effective in reducing pollution in the leather tanning industry. The first phase in the early 1990s helped seven tanneries in Eastern Africa to construct ETPs, resulting in a significant reduction of pollutant discharge. Even though the total value of the equipment for ETPs amounted to US\$ 670,000, the amount of pollutants reduced is comparable to the US\$ 3.0 million Graulhet ETP in France. The use of CTs reduced chemical use by 160 tons, solid wastes by 280 tons and water use by 26,500 cubic metres. Furthermore, CTs lowered the cost of

pollution control by US\$ 182,000 and allowed companies to increase their revenue by US\$ 348,000 annually.

Overall the leather programme has designed, established or upgraded around 57 ETPs or CETPs between 1992 and 2002, 19 of which were in Asia, 36 in Africa and 2 in South America. The largest UNIDO project was the establishment of a CETP in Kasur, Pakistan, which is the third largest CETP in the world.

3.2.4. Key factors for success

The main factors for success, both in Africa and Asia, can be put into four categories: (1) quality of personnel, (2) extent of counterpart government agency involvement, (3) preparedness of the industry to accept and assimilate new technologies demonstrated by the willingness to cover a major part of their costs, and (4) accessible basic funding. If these factors were sufficiently present, then there was a high chance that the project goals would be achieved effectively and sustainably.

In the case of India, the programme received excellent support from the government counterpart and was welcomed by the industry; hence adoption of newer technologies was widespread. In general, tanneries were more receptive to projects that involved CTs because they resulted in lower cost as well as less pollution. In highly populated areas where civil society was concerned with pollution damage, it was much easier to convince tanneries to implement the recommended technical improvements. Lastly, the demonstration units were effective as a “show-how” strategy, which allowed a quick transfer of technology and ensured the continuous usage of those units.

In Africa, the focus on training and capacity building was paramount, as the tanneries first needed the tools to continuously improve their production processes. The success in building ETPs was due to reliable financial support through a revolving

operation fund, whose purpose it was to provide equipment financed by the project to individual private companies. The key principle of the fund was repayment of the value of machinery bought by the programme to a fund managed by a non-profit organization. The collected funds were then used for training, study tours and institutional support for the leather tanning industry.

3.2.5. Challenges

The UNIDO Leather Sector Pollution Control programme has encountered several challenges in supporting the adoption of environmentally sound technologies in developing countries. Some of the challenges were due to the effort to encourage the use of CTs; others were due to institutional constraints. The major challenges are described in the following paragraphs.

The major obstacles to reducing pollutant loadings from tanneries differ significantly between the use of end-of-pipe technology (EOP) and CTs. While CT options have to be tailored to each company according to the individual circumstances, EOP technology is more generic and can be implemented as a ready-made solution. EOP technology is well known by engineers and proven in practice, whereas the use of CTs requires full knowledge of the production processes, innovative potential and ingenuity, which is rarely the case. Consequently, even if it is widely accepted that the use of CTs is the more efficient solution, EOP technologies are used because of their ease to implement.

In general, the use of CTs requires better skilled personnel than the use of EOP technology. Even though the UNIDO programme includes training sessions and workshops, unqualified personnel remains one of the serious constraints to the programme's success. Moreover, plant managers who lack sufficient understanding are

hesitant to change their production processes, being concerned that the quality and character of leather will change with the use of CTs.

Another significant obstacle is the fact that many countries have either too strict or non-existent effluent discharge standards. This leads to a distortion of positive results and to a loss of motivation by tanners to reduce pollution. Ineffective regulations are most constraining in areas where there is insufficient environmental awareness. In addition, one of the main persistent problems in Africa is the excessive use of water and energy due to the under-pricing of these resources.

Lastly, in the case of Sri Lanka, the relocation of tanneries is proving difficult as it has in many other countries. In this case, the Government and the tannery owners agreed in 1989 to move 14 tanneries away from the Greater Colombo area to a new site where there is sufficient land to build a CETP. However, the relocation has yet to take place due to many interest groups involved and the Government's inability to make available the soft loans needed to finance the relocation of the tanneries.

3.2.6. Sustainability of results

The continuous operation of ETPs to the degree needed to comply with environmental regulations depends on the efficiency of enforcement mechanisms, global market requirements and societal pressures. These factors vary from country to country. In India, where these are pronounced, operational effectiveness is virtually ensured. However, where these factors are absent or weak, the effective operation of ETPs depends entirely on the progressive attitude of the tannery.

The operation of CTs depends not only on regulatory pressure, but also on well-trained workers and supervisors in the plants. In regards to this point, UNIDO and its counterpart institutions cannot achieve significant sustainability without further efforts.

Especially in Africa, the key is to introduce common benchmarking systems to assist tanneries in harmonising their production activities.

3.2.7. Transferability

UNIDO's leather programme is easily transferable to any country where the leather tanning industry faces problems with pollution control. It is important for expanding the leather tanning industry in developing countries to learn from the experience of countries with large leather tanning industries, such as India and Pakistan. The importance of CTs cannot be emphasized enough, especially when producers are faced with high price of chemicals and CTs offer them a way to reduce the use of these chemicals. In both types of approach, EOP and CT, there are plenty of experts who can help tanneries to learn from the mistakes of others in order to implement measures more effectively. Due to the fact that tanning techniques differ according to the level of development, it is important to make sure that standards of production are set and implemented, not only to promote exports, but also to make environmental management more efficient.

3.3. Economic incentive— Multilateral Fund (MF)— Multilateral Fund Secretariat (MFS)

3.3.1. The problem

When the Montreal Protocol on Substances that Deplete the Ozone Layer was adopted in 1987, developing countries accounted for only about 10 per cent of world consumption of ozone-depleting substances (ODS). However it was clear that consumption would increase along with their economic development. The challenge therefore was to enable these countries to meet their legitimate needs during the transition period when ODS substitutes were being developed, while at the same time avoiding

incentives for major growth in production and consumption. The costs associated with converting the emerging industries dependent on ODS to ozone-friendly technologies made many developing countries hesitant to sign the Montreal Protocol, particularly when their economic growth was creating a steep increase in the production and consumption of ODS.

A major barrier to the accession of developing countries to the Montreal Protocol was removed when the Multilateral Fund (MF) was set up in 1991(London Amendment) to assist developing countries to comply with the terms of the Montreal Protocol. The Fund provides assistance to countries that are parties to the Montreal Protocol and whose annual per capita consumption and production of ozone-depleting substances (ODS) is less than 0.3 kg. The developing countries that meet these criteria are referred to as Article 5 countries. The developed or non-Article 5 country parties provide contributions to the MF.

3.3.2. The response

The Montreal Protocol and its MF embody a simple but highly effective administrative structure. The parties to the Protocol meet annually to review scientific reports, set policy, adjust ODS phase-out targets, elect officers and executive committee members and monitor the activities of the MF. An executive committee consisting of seven representatives from developed countries and seven from developing countries oversees the operations of the MF, by setting policies, planning and allocating resources according to Montreal Protocol phase-out schedules, and approving projects and programmes. The Multilateral Fund Secretariat (MFS) provides various types of technical and administrative assistance and monitors and evaluates MF-funded phase-out projects.

The assistance given to recipient countries is financed by the MF and delivered by the four implementing agencies of the United Nations and a number of bilateral agencies. In general, the United Nations Development Programme (UNDP), UNIDO or the World Bank (WB) has implemented investment-oriented projects. The United Nations Environment Programme (UNEP) has mainly led non-investment projects, especially those focused on training, networking and information sharing. Starting in 2000, implementing agencies have been responsible for national ODS phase-out plans that combine investment and non-investment activities. The UNEP Headquarters in Nairobi, Kenya houses the Ozone Secretariat and also serves as the MF treasurer. In addition, there are activities undertaken bilaterally between developed and developing countries that provide financial and technical support for projects involving ODS reduction. Contributing countries can use up to 20 per cent of their contribution to develop assistance programmes between their bilateral agencies and Article 5 countries.

The MF has also provided funding to establish national ozone units within the governments of each recipient developing country. The establishment of national ozone units has helped 139 countries to take ownership of their national ozone protection programme by providing a continuous link to the assistance under the MF, as well as a channel of communication to the agencies implementing MF projects.

Financial assistance from the MF for Article 5 countries covers the incremental costs of investment projects but also other activities such as country programme preparation, demonstration projects, institutional strengthening projects, project preparation, technical assistance or training, as well as a compliance assistance programme targeting low volume consuming countries managed by UNEP.

3.3.3. Major outcomes

The operations of the MF have resulted in three major outcomes: increasing compliance by developing countries with the provisions of the Protocol, phase-out of significant quantities of ODS and contributions to sustainable development. These achievements are described briefly in the following paragraphs.

The compliance period for developing countries began in 1999. Countries had to meet the first control measure - a freeze, at the average of 1995-97 levels, of production and consumption of chlorofluorocarbons (CFCs). Virtually all parties to the Protocol have been able to meet their phase-out targets, and there are positive prospects that this success rate will be continued in the future.

Since the inception of the MF, the Executive Committee has allocated a total of nearly US\$ 2 billion to implement more than 5,000 projects and activities. The implementation of these projects will result in the phase-out of the consumption of more than 204,910 ODP tons and the production of about 101,080 ODP tons of ozone depleting substances. Of this total, about 168,610 ODP tons of consumption and 74,600 tons of production (i.e. a total of 243,210 tons) have already been phased out from projects approved through 2004.

MFS can point to a decade and a half of unprecedented success in terms of phase out activities achieved globally with MF-financed projects. Between the late 1990s and 2004, consumption of ODS in developing countries decreased from 267,980 tons to 123,330 tons in 2003, a 54 per cent decrease, as a result of MF-financed projects. During the same period, consumption in developed countries decreased from 1,477,230 to 26,060 tons, a 98 per cent decrease.

MF investment projects have clearly produced measurable results in terms of ODS reductions. In addition, there have been other benefits, largely unrecognised and

undocumented, however, which can best be characterized in a sustainable development framework. These include other environmental benefits, namely reductions in global warming potential, atmospheric emissions and contamination of groundwater. In addition, some projects increased the competitiveness of enterprises in domestic and international markets and have sustained, and in a few cases created employment opportunities.

3.3.4. Key factors for success

Many factors have contributed to the success of the MF in assisting developing countries to comply with the provisions of the Protocol. Five of these key factors are described below.

First, the developed countries that contribute to the MF have met their commitments. They have paid more than 90 per cent of their pledged contributions to the MF. Specifically they paid US\$ 1.46 billion out of a total of US\$ 1.6 billion between 1991 and 2002.

Secondly, the Executive Committee, which oversees the MF, has ensured equitable and participatory management of the MF. It is made up of representatives from seven developed and seven developing countries. Members have equal voting rights but the Executive Committee has never voted; all decisions were based on consensus.

Thirdly, funding of proposals for investment projects and activities is based on strict rules and policies governing the determination of incremental costs. Out of a total requested funding of US\$3.21 billion for investment projects and other activities, the executive committee allocated only US\$2 billion to implement these 5,000 projects and activities. The additional requested amount, US\$1.21 billion, represents costs that were found to be outside the executive committee's funding guidelines.

Fourthly, funding of national phase-out plans, which started in 2000, has forged a closer link between resource allocation and the implementation of compliance. The plans provide a greater level of responsibility to the national government in managing their phase-out schedules according to the requirement of the Montreal Protocol.

Fifthly, the establishment of national ozone units has helped 139 countries to take ownership of their national ozone protection programmes. These units provide a continuous linkage to MF assistance, as well as a channel of communication to the agencies implementing MF projects. In many cases the national units are one of the more effective operations of the environmental regulatory regime in a country.

3.3.5. Challenges

Despite its many successes, the MF faces many challenges in working with developing countries in complying with the numerous and multi-year provisions of the Protocol. Six major challenges persist.

First, despite the impressive achievements of the MF to date, the global effort is still only in its infancy in the phase-out of ODS. In fact, total elimination of all ODS still has several decades to go. CFCs, halons and carbon tetrachloride will not be completely phased out in developing countries until 2010. Methyl chloroform and methyl bromide will not disappear from developing countries until 2015. Hydrochlorofluorocarbons (HCFCs) will not be phased out from developing countries until 2040.

Secondly, a number of developing countries with a low-volume consumption of ODS have encountered difficulties in achieving compliance with the freeze and reduction

targets. Their inability to comply stems from the easy availability of CFCs at low prices, limited control over the inflow of CFCs into the countries, importation of used equipment that relies on CFCs and the increased demand for CFCs as a result of increased prosperity (Anderson and Sharma, 2002 and IFC, 2004).

Thirdly, to the extent that HCFCs were used as substitutes for CFCs, conversion to them now means a double phase-out strategy because of their ODP (five to 11 per cent of that of CFCs). First CFCs must be phased out and then HCFCs, which Article 5 countries are permitted to consume up to 2040 (Climate Action Network-Europe, 2002). In spite of their ODP and their non-eligibility for MF funding, HCFCs are preferred to hydrocarbons with no ODP because they have lower investment costs and are non-flammable. In 2005, ten years before the first control measures for HCFCs come into force, the Executive Committee started to address the elimination of HCFCs by funding surveys of HCFC use in developing countries.

Fourthly, replacing the most widely used ozone-depleting substances (CFC-11 and CFC-12) also reduces global warming potential (GWP).⁴ Larger GWP reductions occur, however, when CFCs are replaced not by HCFCs and hydrofluorocarbons (HFCs), but by readily available and for the most part natural substances such as hydrocarbons (e.g. n-pentane, cyclopentane and isobutane), ammonia, carbon dioxide, water and air. Natural substances contribute only minimally (or not at all) to GWP. They are also alternatives to HCFCs, which as stated above, Article 5 countries are permitted to consume up to 2040. Thus the reduction in GWP resulting from the phase-out of CFCs is offset to some extent by some of the substitutes phased-in, particularly the use of HFCs in the refrigeration and foam sectors (Oberthur, 2001).

⁴ Global warming potential (GWP) is the relative contribution of greenhouse gases, carbon dioxide, methane, CFCs, HCFCs and halons to the global warming effect when the substances are released into the atmosphere. The standard measure of GWP is relative to carbon dioxide, whose GWP is 1.0.

Fifthly, reducing the production of ODS still remains a challenge. The production of CFCs is anticipated to be phased out in a few more years with only a few countries (China, India and Venezuela) still producing them. The production of other ODS, such as HCFC and methyl bromide, will continue for a number of years.

Sixthly, supply shortages arising from restrictions on imports, imposed by an individual country to assist in reducing its CFC consumption, can create unofficial markets and pressure for illegal production or illegal trade. The Multilateral Fund has responded by assisting countries in a number of ways to exercise tighter control on the trans-border movement of ODS. Funding is provided for the training of customs officers, the harmonization of customs codes, and the provision of equipment to detect ODS. Regional networks facilitate information exchange between the governments of ODS exporting and importing countries.

Seventhly, a heightened awareness of ozone layer protection and the implementation of recovery programmes is leading to an accumulation of used ODS. It is reported, for instance, that 300,000 ODP tons of halons are currently held in cylinders in developing countries. Safe storage, reclamation and disposal of such chemicals are pressing tasks.

3.3.6. Sustainability of results

One of the requirements of the protocol is that the technologies funded by MF must be mature technologies. Prior to the executive committee approving the use of substitute technologies, a high-level panel of experts assesses their technical viability.

Additionally, empowering governments and promoting national advocacy for ozone protection in developing countries are ensuring sustainability. MF has built on environmental capacity in all developing countries eligible for MF assistance. This capacity provides a vehicle for the management of these chemicals within national governments and at a regional level, and provides effective exposure and sustainable

implementation of programmes in countries where global environmental challenges are less pressing than economic development concerns.

3.3.7. Transferability

While on one level the MF is simply a financial mechanism that transfers funds to developing countries so that they can phase out harmful chemicals, on another level it is an example of international cooperation, timely action, equity between contributing and recipient countries, the importance of a country-driven approach, and the development of an innovative, accountable and transparent financing structure.

3.4. Voluntary action—National Cleaner Production Centres (NCPC)—

UNIDO/UNEP

3.4.1. The problem

Chapter 34 of Agenda 21 called on international organizations, including United Nations agencies, to “promote, facilitate and finance as appropriate, the access to and transfer of ESTs and corresponding know-how, in particular to developing countries” (UNCED, 1992). The Johannesburg Plan of Implementation went even further and emphasized the need for developed and developing countries to promote sustainable consumption and production patterns (WSSD, 2002).

3.4.2. The response

In response to these calls, several bilateral and multilateral institutions have established programmes to promote the use of cleaner production (CP) and cleaner technologies (CT) in developing countries. This case study focuses on one such

programme, the joint UNIDO/UNEP National Cleaner Production Centre (NCPC) programme.

The basic premise of this programme is that CP can only take root and proliferate in a country if its professionals promote the concept and adjust it to local conditions. The programme targets the transfer of technological know-how through NCPCs.

UNIDO/UNEP take three to five years to fully establish a NCPC in a country, during which time they build up the capacity of the centres to offer five basic services as described in the next section. In the early stage of support, UNIDO/UNEP focus the work of the NCPCs on CP assessments in factories. As the centres develop, they are encouraged to broaden their scope beyond the core activities to address a wide range of additional services: introduction of CP in the curricula of educational institutions; environmental management systems; environmental benchmarking; environmental management accounting; and energy conservation. In those centres initiated more recently, many of these services were included from the start.

The NCPC programme started in January 1995 with seven centres. Since then, 25 full-fledged NCPCs have been established the world over⁵ and more are in the pipeline. UNIDO/UNEP provided bilateral donor funding of approximately US\$32 million for these centres. Of the current 25 centres, 13 are no longer funded by UNIDO/UNEP. However, they all continue to exist, although some are stronger and more active than others.

3.4.3. Major outcomes

⁵ Brazil, Costa Rica, Croatia, Czech Republic, Egypt, El Salvador, Ethiopia, Guatemala, Hungary, India, Kenya, Lebanon, Mexico, Morocco, Mozambique, Nicaragua, Republic of Korea, Slovakia, South Africa, Sri Lanka, Tanzania, Tunisia, Uganda, Viet Nam, and Zimbabwe. In addition, a sector-specific centre and a regional centre have been established (both in Russia), as has a national CP programme in Cuba that links several national institutions together into a network.

The five basic outcomes or services of an established NCPC are awareness raising, training, plant-level technical assistance, financial advice and policy advice. Each service is briefly described below:

- *Awareness raising:* Such activities have been very extensive and have taken many forms (television, press, newsletters, brochures, handbooks, websites, participation at fairs, etc.). Many of the centres have become recognized focal points for CP.
- *Training:* The centres emphasize this throughout. Initially, they focus on CP-specific training usually linked to in-plant assessments (see below). Later, centres broaden their scope of training to many of the non-core subjects as mentioned above. Training, initially offered free or at a heavily subsidized price, can later become a steady source of income for the centres.
- *Technical assistance:* Initially, centres focus on undertaking in-plant CP assessments, partly as training exercises and partly as demonstration projects. Later on, CP assessments continue, but primarily as demonstration projects. Few enterprises are willing to pay the full cost for this, but donors that support the NCPC programme attribute high value to these demonstrations. Enterprises that were involved tended to adopt the low cost or free CT options identified during demonstration projects. In recent years, UNIDO/UNEP strongly supported centres to encourage enterprises to also adopt more complex CTs that require higher investments. Results have been mixed thus far.
- *Financial advisory service:* Since access to financing is a key factor for CT adoption, UNIDO/UNEP encourage the centres to become more

engaged in this field too. It is also seen as a promising source of revenue for centres when they offer such a service.

- *Policy advice:* There has been considerable demand for CP policy formulation. Most centres support their ministry of environment and industry with policy advice. Some centres managed to get paid for such advice, although in most countries it has been given free of charge for marketing purposes.

3.4.4. Key factors for success

The key factors for success of the programme varies among the participating countries. Among the factors, five that are found in most cases are:

- A continued strong interest in CP on the part of government in the developing countries;
- A strong focus on ensuring the financial sustainability of the centres, building them up to run as businesses;
- Not linking the centres too closely to environmental regulatory agencies, so as not to scare away enterprises, which are the primary clients;
- Finding partners at the local and regional levels of government to provide some basic services rather than expanding the national centre;
- Encouraging the centres to branch out into non-core services, keeping them nevertheless closely linked to the core prevention principle of CP.

3.4.5. Challenges

The centres have encountered several challenges as they promoted the CP concept and tried to adjust it to local conditions. Five of these are described below.

First, even though the centres have been very active in raising awareness for CP, overall awareness of CP still remains relatively low among enterprises, especially in larger countries. In part, this simply reflects the size of the task at hand and the relative paucity of resources to undertake it. However, it is also a symptom of the fact that worldwide, CP as a concept, although obviously a sound economic investment for businesses, has not yet captured the imagination of business leaders. Only business leaders' sustained commitment to CP will ensure that CP deeply penetrates into the entrepreneurial culture.

Secondly, business managers are reluctant to pay for CP services for a host of reasons. To some extent this is so because the culture of paying for external help is not an established practice in many enterprises in developing countries. Beyond that, even though the services offered by NCPCs have a strong element of public utility, which suggests that government subsidies should be available, in most cases governments find that they have more pressing issues on which to spend their scarce resources. This has meant that most NCPCs only survived because they obtained funding from international donors. It has also encouraged the trend among NCPCs to branch out into other CP-related activities that are more marketable.

Thirdly, while the small size of most centres is a key to their financial sustainability, it does require them to network extensively if they want to have the desired visibility and leverage. In general, the centres do this but there is always some reluctance because partners in a network can also be viewed as competitors for financial resources.

Fourthly, introducing CT options of medium or high order technological complexity and investment has proven difficult. Indeed, the NCPC programme evaluations undertaken in the past few years have shown that a large majority of the CT options implemented by enterprises as a result of CP assessments have been of a lower

order of technological complexity and investment. Very few of the implemented options have involved transfer of technologies from abroad with more significant potential to reduce pollutants and improve productivity.

Fifthly, there is an urgent need for NCPCs and similar centres to play a central role in the sustainable consumption and production agenda set out in the Johannesburg Plan of Implementation. In paragraph 15, the plan requested national governments to formulate a 10-year framework of programmes that would “accelerate the shift towards sustainable consumption and production to promote social and economic development within the carrying capacity of ecosystems”. As a follow-up to the WSSD, the Marrakech process has called on the NCPCs and similar centres to broaden their services (product design, finance, marketing, corporate social responsibility, etc) in support of this agenda, but so far insufficient actual progress has been made in changing consumption and production patterns, particularly in regard to the resource use intensity of production.

3.4.6. Sustainability of results

Once the financial support of UNIDO/UNEP for centres was terminated, they obtained further financing from three different sources: (1) contributions in cash or kind by the host organization or other stakeholders; (2) income from services to local clients (industry or the government); and (3) income from the implementation of specific CP projects funded by bilateral donors. For the reasons given above, direct government subsidies to the centres seem to be only a theoretical option at present. In practice, most NCPCs only obtain modest, mostly in-kind support from their host institutions, from the government in the form of projects and from industry for services rendered. Thus, for the time being, the role of bilateral donor funding remains essential for the continuity of the centres. This “supply driven” component in the CP programmes reflects to a great extent the differences in actual policy priorities between developed and developing countries.

Some centres are clearly working more effectively than others, both in terms of providing services and acquiring financial support. As of now there is no systematic understanding why this is the case. A strategic analysis of the NCPCs and other CP centres is needed to identify the core operational services and management structures that are responsible for the better performance by some centres.

3.4.7. Transferability

Not only has the NCPC model been established in more than 25 countries, the model has also been imitated by others, both by bilateral donors as part of their own programmes and by governments in developing countries. A multitude of similar centres, perhaps as many as 25 outside of the NCPC family, have been set-up in developing countries.

Based on the experience to-date, the NCPC Programme has better chances to achieve significant impact in countries that have a larger segment of well performing industry with consolidated management systems than in countries in which large segments of industry face rudimentary problems of survival and are in urgent need of restructuring and consolidating management functions first. Particularly in such countries with such other urgent priorities, NCPCs should cooperate closely or be integrated with other management consulting services in providing advisory services to industry.

3.5. Voluntary action—Cleaner Production Technical Assistance and Loan (CPTAL)—Asian Development Bank (ADB)

3.5.1. The problem

The Asia and Pacific region's remarkable economic growth has been supported largely by the expansion of its industrial base. This industrial boom, coupled with urbanization, has resulted in severe environmental degradation as an unfortunate side

effect of economic growth. The economic losses reflect inefficiency in the utilization of energy, raw materials, and other resources in the production of goods and services. This is partly a legacy of pricing policies that did not provide adequate incentives for conservation and efficient resource allocation. Between 30 and 70 per cent of industrial pollution is linked to waste and inefficiency resulting from the use of obsolete technology, inadequate knowledge of available cleaner technology (CT), low level of environmental awareness, and poor enterprise management. Given that natural resource usage will continue to grow rapidly in developing member countries (DMCs) with economic growth, environmental quality is anticipated to further deteriorate and related economic loss increase unless technology and management are significantly improved. Preventing pollution by using CTs and waste minimization in industrial and related sectors represents a strategic link between economic development and environmental protection in DMCs.

3.5.2. The response

The Asian Development Bank (ADB) started incorporating environmental management and aspects of cleaner production (CP) in its technical assistance and loan projects in the late 1980s and those projects focusing on CP alone started in the late 1990s. Its technical assistance approach has evolved from CP demonstration projects to broad promotion of CP in all aspects of national development policy with a focus on integrating economic and environmental improvement. The CP component in ADB loans is primarily for energy conservation through fuel-source change, process modification, material recovery and equipment retrofitting,

In 1995, ADB recognized that most technical assistance projects for CP had been piecemeal and showed a lack of interrelation with succeeding or previous projects funded by ADB or by other agencies. In some cases, ADB assistance had “leap-frogged” to direct provision of investments for retrofitting or upgrading of firms using cleaner or energy efficient technology in a sub-sector of an industry, instead of focusing initially on awareness promotion, establishment of the required institutional, regulatory and legal framework and information systems, and promotion and building of technical capacity. A review clarified that successful promotion of CP depends on systematic and strategic capacity building interventions, not on simple demonstrations that cleaner CT can help companies reduce pollution and thus save money. Since the review of ADB’s technical assistance for CP, both its regional and country specific efforts have more systematically and comprehensively addressed the promotion of CP.

In 1999 ADB initiated a regional technical assistance project for CP, *Promotion of Cleaner Production Policies and Practices in Selected Developing Member Countries*. The objective was to accelerate the development of national policies and action plans for the adoption of CP. To achieve this objective, it directly assisted five participating Asian nations (India, Indonesia, Philippines, Thailand and Viet Nam) to develop a policy framework, integrated action plans and the institutional capabilities they needed for rapid and efficient adoption of CP. The project then disseminated the lessons learned to other countries in the Asian region by supporting training on policy development, CP planning and emerging areas for the application of CP.

ADB has also supported several country-specific technical assistance CP projects: The People’s Republic of China (1998); India (2000); Sri Lanka (2001); Thailand (2001); Indonesia (2002) and the Philippines (2002).

From 1988 to 2003, ADB has provided more than US\$ 48 million in technical assistance funds for adoption of CTs in SMEs; development of sector technical guidelines; training; establishment of CP technology centres; research and development of CTs; promotion of energy conservation; policy formulation and legislative support; and development of institutional capacity.

Total CP lending volume from 1988 to 2003 for 27 loans has amounted to US\$ 3.6 billion, comprising a little over 4 per cent of the total ADB lending volume of US\$ 83.9 billion. Of the US\$3.6 billion, 47 per cent was loaned to The People's Republic of China, 20 per cent to India, 13 per cent to Indonesia, 8 per cent to the Philippines, 7 per cent to Thailand, 3 per cent to Malaysia, and 2 per cent to Bangladesh.

3.5.3. Major outcomes

The regional CP programme achieved part of its design objective to develop national CP policy and strategies. Thailand and Viet Nam have adopted draft national action plans with some modifications, while Indonesia has adopted a national policy and programme for CP as part of its environmental policy. India and the Philippines both have government-supported programmes to promote CP, though without a national level policy or strategy.

Among other nations benefiting from ADB national projects for CP, Sri Lanka has adopted a national policy for the integration of CP into industrial development as part of its national environmental policy. In part attributable to the regional programme, China promulgated a Law on Promoting Cleaner Production in 2002.

ADB-funded loan projects for CP have funded a variety of CT options. Several projects have focused on energy conservation by changing the fuel source; others on modification of existing processes, recovery of reusable materials, equipment retrofitting

and rehabilitation. Sectors covered by these projects were thermal power plants, leather tanning, fertilizer, cement, metallurgical, pulp and paper and energy supply. Some projects included credit line components for SMEs to undertake investments in CTs.

3.5.4. Key factors for success

Successful enactment of a national CP policy must begin with a dialogue between public and private stakeholders to identify broad national goals, policy objectives and the specific constituents of a national CP policy.

Extensive adoption of CTs takes place only in situations where enterprises encounter effective governmental implementation of environmental standards. The use of complementary environmental policy instruments, such as market-based incentives and public disclosure can also add to the pressure to comply with environmental norms.

Technical assistance for CP must meet the needs of SMEs, such as simplified approaches to environmental management and CP as well as assistance in preparation of proposals to access local financing. Facilitation of local lending to SMEs through a multinational loan guarantee facility, supported by a project development facility that helps to evaluate and package projects, can be a key factor for success.

Above all, however, for dissemination to spread widely there must be a network through which firms in a sub-sector can learn of the success of their peers in applying principles of CP. In most developing countries governments lack such a network, so the engagement of industry associations, cooperative networks and other private sector groups in the dissemination has been an essential factor.

3.5.5. Challenges

Without the underlying CP policies and planning, which can create forces for change and orchestrate the available resources, there is little hope for the rapid adoption

of CP as a result of CP demonstration projects. However, securing the effective engagement of the government agencies needed to introduce policy changes and to engage in long-term planning is a challenging and long-term task. The focus of most developing country governments on near-term issues has proven a significant obstacle in gaining their attention and commitment to a process of change, which will occur only with perseverance over a long period.

Sub-national governments, both of provinces and municipalities, are essential avenues for promoting the concept of CP. However, they often lack the expertise needed to promote it and to provide sub-sector specific advice on specific CTs. While most countries have national centres that provide CP services, these national centres have limited capacities to serve multiple clients and to provide company-specific analysis and problem solving to identify those solutions that can work in the operating environment of a particular company.

Dissemination and application of the CP concept among SMEs on the basis of its own economic merits does not occur easily. There is a need to support the dissemination of the concept through promotional (awareness raising and training) activities and policy measures. Significant obstacles to dissemination among SMEs include both the lack of instructional materials written for the limited technical and managerial skills of those firms, and the difficulty of measuring results of CP among firms that have little ability to measure their own processes and keep business records.

3.5.6. Sustainability of results

Most of the efforts of ADB to introduce CP have been sustained, though to varying degrees and only when either the host government has understood the benefit of CP from the beginning and a ministry with some leverage has asked for the project or,

when private sector organizations, such as industry associations have subsequently seen the value and accepted the challenge. The surest route, however, to sustainability is the clear willingness of a high-level element of the government, best defined as part of the terms of a loan or grant, to formulate supporting policy and seek budgetary resources to continue the propagation of the project work.

Sustainability requires the incorporation of the concept of CP in several sectoral government agencies that must develop the institutional capabilities to better understand the requirements of sustainable development and CP. They need to collaborate with each other and with the many private sector stakeholders to achieve their common interests in national strategic planning for CP.

Sustainability also requires the involvement of all stakeholders for exchange of operational and technical information to create a critical mass of participants that can sustain the effort.

Lastly, sustainability requires that external donors, lenders and other concerned international organizations promote common objectives, actions and concerns in order to avoid the duplication of programmes.

3.5.7. Transferability

ADB's experience with CP shows that the tactical solutions will differ by country but that the underlying premises of the approach do not differ significantly. The strategy for each country should therefore include the following elements: policy advice; investment advice; national and local strategic and action planning; targeted outreach for SMEs; engagement of all stakeholders; development of locally appropriate training materials; and building capacity of firms to measure their achievements.

In the regional CP programme described earlier, some multi-country training showed that similar issues confronted the implementers. The experts implementing the project were able to actively compare during the life of the project the obstacles and keys to success in the five countries involved. Basic techniques and approaches were found to be highly transferable from one country to another, with minor allowances for differences in cultures and economic systems.

3.6. Voluntary action— Global Reporting Initiative (GRI)—UNEP collaborating centre

3.6.1. The problem

During the early 1990s, more and more companies put certifiable environmental management systems in place. They became more involved in voluntary initiatives that aimed to improve environmental and social conditions. When they started reporting on their efforts, it became evident that there was a need for structured reporting to improve the usability and benchmark-ability of their reports. They lacked a generally accepted reporting framework to guide and enhance the credibility, comparability and comprehensiveness of sustainability reports.

3.6.2. The response

In 1997, the NGO Coalition for Environmentally Responsible Economies (CERES) in partnership with the Tellus Institute (both based in the United States), convened the Global Reporting Initiative (GRI) with the aim of designing and building acceptance of a common framework for all organizations sustainability reporting. In 1998, the United Nations Environment Programme (UNEP) joined the initiative as a collaborating partner. With the generous financial support of the United Nations Foundation and a number of American foundations, UNEP and CERES were able to grow

the GRI from a start-up and transitional phase to being a permanent institution, a UNEP Collaborating Centre, which has been incorporated as an independent institution in the Netherlands in 2002 and is headquartered in Amsterdam.

The mission of GRI is to develop and disseminate globally applicable Sustainability Reporting Guidelines for voluntary use by organization's reporting on the economic, environmental and social dimensions of their activities, products and services. The goal of GRI is to raise the practice of sustainability reporting to the level of rigour, credibility, comparability and verifiability of financial reporting.

GRI issued the first version of the Guidelines in 2000. The second version dating from 2002 was released at the WSSD. Its eleven reporting principles and 97 performance indicators provide guidance on how and what to report. The third generation (G3) of the guidelines is scheduled to be released in late 2006, and will reflect the global experience gained in reporting since 1997.

The GRI is a network-based organization, which operates through its innovative multi-stakeholder governance structure. At the core of the GRI governance is its Board, Stakeholder Council and Technical Advisory Committee, as well as its secretariat, which coordinates, among others, various multi-stakeholder working group activities, and wider global network.

3.6.3. Major outcomes

The results of the GRI initiative can be seen quantitatively and qualitatively. The quantitative impact is the number of organizations that follow the GRI Guidelines in reporting publicly on their sustainability performance. The majority of the Fortune 250 corporations that issue sustainability reports follow them. In addition, international organizations, such as the World Bank, an increasing number of public authorities, SMEs

and NGOs use the GRI Guidelines. As of early 2003, the number of companies that used the GRI Guidelines was just over 150. By the end of 2005, there were over 750 self-declared GRI reporters worldwide.

In terms of qualitative impact, catalytic effects and learning are shown through corporations adapting their policies and strategies and management and reporting systems to reflect the triple bottom-line (TBL) approach of sustainability. In turn, stakeholder organizations and financial markets are rewarding them for this.

3.6.4. Key factors for success

Several factors have contributed to the success of the GRI as a global public policy network (transnational organization). Of significant importance are (a) its meeting a real stakeholder need, (b) significant stakeholder involvement, (c) openness and flexibility in taking into account a multiplicity of perspectives and (d) the commitment and skills of its early initiators, all of which are discussed below.

The GRI process responded to rapidly developing stakeholder demand for more and better information on the meaning of ‘sustainable development’ and how organizations were contributing to this goal. It filled a unique gap by being a reporting framework with its guidelines and supplementary documents. It avoided duplication with others by not being a performance standard (e.g. SA 8000); not being an internal management standard (e.g. ISO 14000), not being an assurance standard (e.g. AA1000S) and not a code of conduct (e.g. International Chamber of Commerce Charter, United Nations Global Compact and Organization for Economic Co-operation and Development guidelines for multinational enterprises).

Its innovative bottom-up inclusive process displayed what some call “global public policy networks” involving stakeholders from all regions of the world. Today

thousands of individuals from over 100 countries, representing corporations, governments, NGOs, consultancies, accountancy organizations, business associations, rating organizations, universities and research institutes are involved in the global GRI network.

The GRI process allowed participants of diverse backgrounds and interests to communicate their concerns while encountering a multitude of perspectives on environmentally and socially relevant issues. Bringing people together with different views, GRI has not only created a pool of knowledge on sustainability but also an experiential field where participants, exposed to diverging approaches to sustainable reporting, frequently widened their views. Personally meeting those who represent the positions ‘of the other side’ through their involvement with GRI, participants often began to look at problems from several perspectives and occasionally even experienced a gradual convergence of views. For instance, while civil society representatives learned about the complexities of implementing sustainability reporting in practice, business participants learned what issues mattered to the people outside business and to better understand their own bearing on society.

The personal commitment and skills of the initiators of the GRI process are frequently mentioned as crucial factors for the success of the GRI in its early stage. These public sector ‘entrepreneurs’ understood the importance of a focused and unique agenda and had the ability to enroll others in support of this agenda.

3.6.5. Challenges

GRI is responding to many problems common to those transnational organizations providing public goods. These challenges include securing funding for its operation, accommodating its key financial supports, balancing expertise and diversity, making sure

the guidelines can be used in conjunction with other codes and standards, including auditing or assurance standards and involving the public sector. These concerns are discussed below.

GRI was established as a non-profit organization, dependent on funding from its participants, governments and foundations. Since the GRI Guidelines are made freely available to all organizations, the GRI has been reliant on continuing support from donors and a rising membership base for its continued operations. Yet while there has been a high demand for GRI Guidelines, its output remains a public good for which free riders see no need to pay. GRI has had to develop a series of marketable products and services that do not compete with private suppliers of similar services and to secure greater financial support from the private sector, aware of the need to maintain a healthy balance in private and public funding.

A challenge in the GRI's governance structure has been how to accommodate the role that key financial supporters play in the permanent institution. In many non-profit organizations, key financial supports are often given board seats or other significant governing roles within the institution to recognize their contribution and to create an explicit accountability of the organization to its key financial stakeholders. GRI has found a solution through the introduction of the concept of organizational stakeholders (at the end of 2005 there were more than 250), which are organizations both large and small that contribute an annual fee yearly that is proportionate to their annual income.

Organizational stakeholders vote annually for GRI's Stakeholder Council members. In turn, the Stakeholder Council members partially select or approve Board appointees.

Another challenge in GRI governance has been the balance between expertise and representation, seeking to accommodate efficiency and large size. The breadth of GRI's mission requires broad representation across a variety of dimensions. These include

institutional sectors (business, government, professions, NGOs and academia), topical sectors (environment, labour and human rights), geographic regions and developed and developing countries. Effective management of this representational challenge is key to GRI's success.

Consistency in the application of guidelines is still an issue. Without it, assessing and comparing the actual performance of companies will always be questionable. In some cases there appears to be inconsistent and incomplete use of the GRI guidelines. Just over 150 of the 750 self-declared reporters mentioned above meet the stricter 'in accordance' criteria for GRI reporting.

Finally, a remaining challenge is greater involvement of the public sector in a process that has been closely associated with the private sector. It is very important for GRI to actively engage national governments and inter-governmental entities in supporting and adopting its work. This involvement takes the form of explicit support for the reporting standards and the application of the standards to public agencies. The first is important for widespread adoption of reporting requirements and the second to promote the greatest levels of both transparency and impact.

3.6.6. Sustainability of results

A number of indicators point to the sustainability of GRI process, namely its establishment as an independent organization, acceptance of the GRI Guidelines, a long-term financing strategy and its use by businesses, all of which are touched on below.

By the end of 2002, GRI was fully operational as an independent international organization with affiliation to UNEP, directed by a new board with high-level decision-makers having an interest in advancing corporate disclosure worldwide. Central to the legitimacy of GRI is the independence of the decision-making process from the undue

influence of one stakeholder group. Moving GRI from its early status as a project administered by other organizations to that of an independent and internationally recognized organization has greatly helped to achieve this objective. Its more robust infrastructure has also helped to support expanded, long-term outreach and to develop a long-term funding mechanism.

The GRI guidelines have become the leading, internationally recognized framework for sustainability reporting. Their impact can be seen in leading global corporations referencing GRI indicators in their annual sustainability reporting, as well as in rating agencies and financial analyses using GRI-based reports and indicators as references in their own work. Their impact is also confirmed in regular benchmark surveys of top global corporate reports done under the auspices of UNEP.

A long-term financing strategy for the GRI has been developed and approved by its board, paving the way for it to begin delivery of services, such as online registration of reports and training of reporting managers.

Corporations are increasingly using corporate reports that follow the GRI Guidelines as a practical tool to describe how they are implementing the principles of the United Nations Global Compact. Corporate participants in the United Nations Global Compact are encouraged to use indicators from GRI Guidelines in producing their annual communications on progress (reporting) as required by the Global Compact.

3.6.7. Transferability

In its early days of defining a global governance model, GRI participants looked at global public policy networks, such as the World Commission on Dams, for guidance. Today, more recent global initiatives with multi-stakeholder participation have been able to use the GRI process and governance model as an example. The catalytic effect of the

GRI initiative on other agencies and governments has been most evident in broad support for an integrated approach to sustainability reporting; agreement that more attention needs to be paid to the non-environmental aspects of sustainability in corporate reporting; acknowledgement that the GRI Sustainability Reporting Guidelines are of direct relevance to governments; and agreement on the need for a consistent, credible, international approach.

3.7. Voluntary action—Awareness and Preparedness for Emergencies at the local level (APELL) – UNEP

3.7.1. The problem

As economic development continues, we are witnessing an increase in the frequency and gravity of technological disasters around the world such as oil spills, refinery explosions, chemical spills and explosions from transport, release of toxic chemicals in accidental discharges from industry, dispersion of biological agents, among others.

Some of these accidents were: a toxic spill from a chemical residue reservoir of a pulp factory in Brazil (March 2003) that left thousands of people without drinking water for days; a gas well explosion in China (December 2003) that took approximately 250 lives; and a train blast in Iran (February 2004) that took approximately 330 lives.

The majority of accidents are easily avoidable through the application of standard processes, or by more adequate safety management systems. However, growing economic development together with insufficient safety measures, cause the number of industrial disasters, and hence the number of people affected to increase. National governments must take preventive measures that more effectively mitigate disasters in high-risk areas.

These measures include: developing national and local contingency plans; promotion and enforcement of industrial safety management systems, regulating development in hazard-prone areas, in high risk industrial zones and along transportation routes; distributing information to exposed populations on risk and hazards; and training emergency services and communities on disaster preparedness measures.

3.7.2. The response

The United Nations Environment Programme (UNEP) initiated the Awareness and Preparedness for Emergencies at the Local Level (APELL) programme in 1987 to advise national governments on how they, in cooperation with industry, could work with local leaders to identify the potential hazards in their communities, and to prepare measures to respond to industrial accidents. The core of the APELL programme is a modular, flexible methodological tool for preventing accidents and, failing this, to minimise their impact. This is achieved by assisting decision-makers and technical personnel to increase community awareness and to prepare co-ordinated response plans involving industry, government and the local community.

Specifically, implementation of an APELL programme at the local level has two objectives. First, it enhances the capacity of local emergency services to improve their knowledge and effective use of prevention and preparedness tools and mechanisms, to properly reduce the impacts of disasters, including public disaster communication systems (before, during and after the disaster). Second, it gives advice on how to raise awareness of exposed communities of the type of risks to which they are exposed and of the potential human and environmental impact they can expect, in order to enable them to better prepare and react in case of a disaster.

APELL helps communities to develop the information and decision-making structures they need to address the hazards facing them. It can be useful in any situation that requires joint planning for disasters by several parties. By engaging stakeholders in a process of structured dialogue and coordination, the APELL 10-step approach leads to the development of a single, unified emergency response plan. Involving the entire community in drawing up a crisis plan, the APELL process fosters awareness raising and feedback from the local people, who will then have the correct reflexes in an eventual disaster and understand what must be done for crisis management.

3.7.3. Major outcomes

It is difficult to judge exactly how successful APELL has been in improving better preparedness and emergency response, since its success is valued in avoiding the deleterious impacts of disasters. However, it is obvious that the APELL approach successfully raised awareness about disasters on both the national and the local level. Seminars and other outreach mechanisms on community preparedness for disasters, and the application of the APELL process have already taken place in more than 30 countries around the world. Feedback on national implementation has shown a number of successful uptakes, and there is ongoing interest by national authorities to expand the efforts. While there has been no formal measurement or global census, regular feedback from national delegates, industry and professionals shows an encouraging level of awareness around the world of the need to involve local communities in emergency planning. Furthermore, UNEP has been closely involved in facilitating the implementation of community preparedness programmes by government and industry in India, Brazil, France, Peru and other countries as well.

The programme application was initially focused on the chemical industry. It has since been enlarged to the transportation of dangerous goods (TransAPELL), to the safe

handling and management of dangerous goods in ports and terminals (APELL for Port Areas), to the mining industry (APELL for Mining) and most recently to natural disasters through the development of a series of brochures (APELL for Earthquake Risks, APELL for Floods, APELL for Schools and Educational Buildings and APELL for Tsunamis – all with a focus on a community-based approach to disaster reduction). As of 2005, the programme had produced more than 20 technical reports and other material to assist awareness raising and capacity building efforts on disaster prevention and emergency planning in vulnerable areas.

3.7.4. Key factors for success

APELL achieves its aims through community participation in emergency planning, via a structured dialogue between representatives of the source of the hazard (e.g. the industrial complex), local authorities (the emergency services, e.g. fire, police, hospitals) and community leaders who inform their constituencies. Communication is achieved through a local multi-stakeholder ‘co-ordinating group’ that reviews the hazardous situation and then proposes some measures to address the danger. These could, for example, include technology improvements to reduce the risk of accidents, or better community understanding of how to behave in case of a specific crisis. The outcome is an emergency plan to which the community has provided substantial input and which ordinary citizens understand.

Success factors for community participation include: (a) a neutral facilitator to bring the various social partners together; (b) transparency in hazard information (risk communication); (c) regular rehearsal of the contingency plan, and community participation in rescue drills (emergency drills); (d) a governmental framework for community information and coordination of rescue services (national government support); and (e) committed and actively engaged community leaders. It is important to

stress that the above is a participatory rather than authoritarian approach to emergency response planning. Nevertheless, during an actual emergency, a structured command-oriented procedure to crisis response is always necessary.

3.7.5. Challenges

The overall responsibility for emergency prevention, preparedness and response planning lies with multiple governmental authorities. The overlapping responsibilities often complicate preparation for and response to disasters and they mainly make provisions for organizing disaster relief rather than prevention and emergency planning. Moreover, their responses are eventually constrained by the lack of training and technical equipment.

Involving the community in emergency prevention, preparedness and response are essential features of effective response to industrial accidents and natural disasters. This is a challenging task, however, for two significant reasons. First, community members are reluctant to be involved because of the time commitment, lack of skills in this field and fear of learning about risks in their immediate environment. Secondly, community activists are too often overloaded with work and in some instances use the co-ordinating activity for putting pressure on local governments and other stakeholders to force through their own agenda.

A more general problem with the current approach is its main focus on emergency planning. As mentioned above, most accidents are easily avoidable by applying lessons learned from other's mistakes, and by improving industrial process safety management. Even though firms are usually keen on supporting programmes that avoid accidents, which could potentially harm their property and image, not enough is being done to improve safety management. According to an OECD report, "managerial and/or

organizational omissions account for the causative factors for about 90 per cent of the accidents of which causes are known.” The challenge is to make sure that industries and companies in developing countries use international standards and regulations to ensure that adequate safety measures are in place to prevent industrial disasters to the extent possible.

3.7.6. Sustainability of results

National governments have an important lead role in promoting the prevention and preparedness for industrial accidents through framework arrangements and other forms of encouragement, communication and incentives. The best way to encourage local communities to engage in emergency preparedness activities is by appointing a designated national focal point that undertakes the necessary awareness raising and information exchange with local communities.

The benefits of emergency preparedness are felt at all levels in terms of greater community safety, reduced losses in industry from spills and manufacturing down-time, improved training and competencies in local authorities, and at the national level, much improved readiness for disaster relief. All these outcomes require a serious level of cooperative up-front work, which will only occur if such a programme is strongly promoted by industry associations, governmental authorities and facilitating bodies as well as community leaders.

In summary, sustainability for communities exposed to potential major natural and industrial hazards requires a framework of emergency crisis management that both relies on and supports public consultation. At present, planners and local communities in many places still need practical guidance in order to move ahead. The APELL process gives a

model for an effective community awareness and preparedness procedure that is applicable in all countries and for all types of risks.

3.7.7. Transferability

The APELL process was itself developed through a widespread consultation process that relied on input from national authorities, industry experts and community leaders. It is a model that can be easily adapted to the specific circumstances in many countries and diverse situations, including both natural and man-made disasters. The worldwide APELL network is available to give advice and guidance to all stakeholders who wish to take the community-oriented approach to disaster management.

3.8. Public disclosure—Program for Pollution Control, Evaluation and Rating (PROPER)—World Bank

3.8.1. The problem

Starting in the 1980s, the Indonesian Government charged the Indonesian Environmental Impact Management Agency (BAPEDAL), with enforcing standards on discharges from industrial plants. BAPEDAL, however, had limited financial and technical capacity, which led to doubts about whether compliance standards could be successfully implemented. This problem was exacerbated by a weak judicial system at the provincial level and general problems with governance.

By the mid-1990s, the Government was becoming concerned about the risk of severe damage from pollution. Indonesia's airborne concentrations of suspended

particular matter doubled between 1978 and 1988, exceeding the standard recommended by the World Health Organization (WHO) by 80 per cent (Afsah and Vincent 1997). Estimates in 1994 indicated that industrial pollution accounted for 25 to 50 per cent of the total pollution load in the rivers on the island of Java. Industrial contamination had become a serious health problem.

Not only did the Ministry of Environment have limited resources to regulate industrial pollution, but also the governors of the provinces, whose primary concern was increasing employment and income by attracting investment, had little incentive to control the environmental impact of industrial growth.

Until the early 1990s, Indonesia's system of environmental management was a conventional command-and-control regulatory approach. It required four key elements for successful implementation: (a) good environmental regulations; (b) an overall legal system that facilitates enforcement; (c) judiciary and public agencies that have the political will to undertake credible enforcement; and (d) environmental agencies that have adequate financial and technical capacity. To a great extent these four elements were not in place, which resulted in partial and imperfect compliance with environmental norms.

Indonesia's system, like many around the world, traditionally oversimplified regulatory compliance by designating a plant as either in compliance or in non-compliance with all pertinent regulations. There was no room for partial compliance. As a result, minor violations of norms, including such matters as failure to file monthly reports, were lumped in the same non-compliance category as significant violations of norms, such as continuously and excessively exceeding them. This situation created a distorted picture of the industrial pollution problem. This system resulted in fostering an ultimately antagonistic relationship between industry and regulators. Moreover, the system was limited because a plant was often penalized for non-compliance but not

rewarded for satisfactory performance. Given the potential of industrial growth, neither industry nor regulators had strong incentives to improve performance.

3.8.2. The response

Given the weak enforcement of formal regulations, the situation forced the Ministry of the Environment to develop an innovative approach to environmental regulation, beyond the CAC system. As a result, BAPEDAL initiated the Programme for Pollution Control, Evaluation and Rating (PROPER) in 1995. BAPEDAL decided to use ratings of the seriousness of pollutant discharge and public disclosure of the ratings to create incentives for plants to improve environmental performance. The objectives of the programme were to promote compliance with existing regulations and reward plants whose performance exceeds regulatory standards.

The basic idea of PROPER is to disclose environmental ratings of plants to the public, which would empower external stakeholders to induce change in pollution behaviour by holding plants accountable. Disclosure would inform NGOs and communities who can use the political process to influence regulatory enforcement or more informal mechanisms, such as pressuring polluters to conform to social norms. The target audience for disclosures also includes investors and consumers who can be expected to respond to the environmental quality of the company in which they invest or from which they purchased products.

PROPER is based on a five colour coding system described in Table 7. Each plant is classified by BAPEDAL with one out of five colour codes.

Table 7. PROPER colour-coded compliance status

Compliance status	Colour rating	Performance criteria
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Compliance	Gold	All requirements of the green rating, plus achieving in the areas of clean technology, waste minimization, pollution prevention and conservation.
	Green	Above standard and ensures good housekeeping, maintenance and monitoring.
	Blue	Efforts to only meet the standard.
Non-compliance	Red	Minimum effort and does not meet the standard.
	Black	No effort to control pollution and causes serious environmental damage.

During the pilot phase of PROPER in 1995, BAPEDAL classified the compliance status of a sample of 187 plants based only on their water pollution. The initial assessment concluded that two-thirds of the plants failed to comply with Indonesian regulations. Prior to public disclosure, the performance results were privately released to the plants. By the end of the year, 18 per cent of the plants scrambled to meet the minimum standards, and were eventually added to the blue group. More importantly, 50 per cent moved out of the black category. Plants began to comply with regulations even before public disclosure occurred. Once public disclosure was made of the ratings, further improvements were seen. Over half of the plants were rated as being in compliance and only one plant remained in the black category.

In 1997, the programme was temporarily suspended with the onset of the Asian financial crisis, but was reactivated in 2001 under a newly elected government. Several dimensions of the old programme were revised, including the mandatory participation of selected plants and the expansion of the programme to rate air pollution, hazardous waste treatment and community relations. In addition, significant power was devolved to local and regional authorities and locally elected councils were made responsible for pollution abatement.⁶

⁶ Blair, Harry (2005). "Building and Reinforcing Social Accountability for Improved Environmental Governance." Paper for Environment Department, World Bank. 30 October 2005.

Given the more rigorous assessment, 40 per cent of plants rated under the new programme, PROPER II, were rated as black in 2002. However, as before, a second round of assessments resulted in significant improvement among the plants. By 2004, only 4 per cent were rated black and the percentage rated as green had increased to 60 per cent.

In 2005, PROPER audited a total of 466 plants. The initial review assigned 23 to the green category (5 per cent), 221 to the blue category (47 per cent), 150 to the red category (32 per cent) and 72 to the black category (16 per cent).

3.8.3. Major outcomes

BAPEDAL has found that under the PROPER programme outcomes are fundamentally determined by the responsiveness of plants to threats of economic, political, social or physical sanctions if they fail to compensate the community or reduce their emissions. Negative outcomes can result when a community takes extreme measures during negotiations with plants, such as threatening physical harm to factory workers. In many cases, plant managers have responded directly to communities using various creative means, in addition to monetary compensation, such as constructing temples or community centres.

BAPEDAL also found that creating a system with green and gold ratings fostered a more positive relationship between regulators and industry by recognizing and motivating good performance. By actively encouraging good performance, plants also move closer to international standards, such as ISO 14001, and have an easier time making the necessary changes to qualify for ISO certification. Becoming certified can open the door to becoming an internationally competitive firm.

3.8.4. Key factors for success

The key factors for success of both PROPER and PROPER II are mainly three-fold. First, armed with credible information, external stakeholders are in a much stronger position to negotiate pollution control agreements with neighbouring plants. The PROPER system has added critical information to pre-existing stakeholder perceptions of plants by certifying the claims of local communities, who then used PROPER ratings to engage the most serious polluters. Secondly, PROPER provided an accountability mechanism that avoided heavy reliance on legal support and a strong judiciary system to mediate disputes. Widespread public disclosure allowed communities to relate their own experiences directly with the claims of plant managers, and the simplicity of the rating system allowed the plant managers and stakeholders to be able to speak the same language. Finally, the low costs of directing and administering the programme contributed to its success. Direct costs only entailed the development of a rating system and the dissemination of the results. Additional costs were incurred in the hiring of consultants to assist in the analysis of data. Including additional expenses, PROPER's cost for the first 18 months amounted to only US\$100,000. Given that this expense resulted in approximately a 40 per cent reduction in organic pollution, the programme can be considered to be extremely cost-effective.

3.8.5. Challenges

Despite the success of PROPER, the programme encountered obstacles and problems at various stages. One of the initial challenges revolved around acquiring adequate technical capacity and creating a simple yet comprehensive rating system that translated the country's complex set of environmental regulations into a colour-coded system. Increased technical capacity was also necessary to develop a methodology to aggregate multiple indicators and devise a composite index. Additional challenges arose when trying to avoid political repercussions from giving red or black ratings to plants

owned by well-connected figures. Significant effort was spent in formulating a strategy to avoid turning such figures into enemies.

The initial PROPER rating system was limited to assessing water pollution from relatively large plants. In more recent years, the programme has expanded rating on air pollutants and toxic waste. While approximately 90 per cent of Indonesia's water pollution is accounted for by the medium-sized and large plants participating in PROPER, most plants in Indonesia are SMEs and well below the radar of public awareness. Because the programme tends to be more successful when targeting large-scale plants, which are concerned with their image, one of the ultimate challenges will arise when BAPEDAL tries to expand its rating system to the scores of SMEs. Challenges in maintaining public awareness and activism are likely to occur as the plants located in poorer, less educated communities are rated.

3.8.6. Sustainability of results

As already discussed, the sustainability of the programme and improved environmental performance depend on the vibrant relationship between BAPEDAL, external stakeholders (including both local communities and market-based actors), and industry. If either the technical capacity of BAPEDAL decreases or operational costs increase, the sustainability of results will be affected. More importantly, if the stakeholders are not prepared to put pressure on plants, they will not have the extra incentive to improve their environmental performance.

The sustainability of the programme was severely impacted by the Asian financial crisis in 1998, whereby the PROPER programme ceased to exist due to considerable political and administrative turmoil. The programme was revived on a larger scale in

2002 to include assessment of air emissions and solid waste. In 2004-2005, BAPEDAL audited a total of 466 plants, up from only 85 in 2002.

3.8.7. Transferability

Public disclosure programmes have widespread appeal because the areas for benchmarking are relatively flexible. In the case of PROPER, the strength lies in the fact that there are clear environmental performance standards and an easy to understand reporting format.

In order to make the system extra flexible, it can accommodate regional or national differences by tailoring the scope of the benchmarking to create rating systems that account for different sizes in plants, different levels of environmental quality and different industries.

The transferability of the programme is evident by the number of similar programmes that have been introduced in the Philippines (EcoWatch), Mexico (Public Environmental Performance Indicators, or PEPI), Colombia's public disclosure programme and China's GreenWatch programme. The political appeal of a PROPER type programme made it easy for these countries to initiate, but they have encountered difficulties in the long-term institutionalisation of the programme.

4. Insights Extracted from Case Studies

The eight case studies as well as some of the programmed summaries in annex 1 provide numerous insights on how the UN system and regional banks have formulated effective and coherent programmes and a limited number of insights on how they have coordinated their efforts. The authors of the report have extracted a limited number of insights from the case studies in this section. Table 8 below uses key words to identify the

insights, which are then briefly described for each of the eight case studies. At the end of the descriptions, the authors identify a few insights that are common to more than one case study.

As selection of key insights is influenced by the author's experiences, they invite the reviewers of the issue paper to make their own lists of key insights that they can extract from the case studies and identify those they find common to more than one case study. These lists as well as other comments on the case studies and general observations put forward in the next section would be the basis for meeting to discuss the formulation of new initiatives by the UN system and regional development banks to contribute to developing country efforts to improve the environmental performance of their industrial sector.

4.1. Command and control regulation — IPPC — World Bank

- Building institutional capacity for industrial environmental management at the state/provincial level of government required a long term (10-year) commitment. It needed to consist of general management improvements (accountability, transparency and tighter internal controls) as well as skill upgrading of technical and scientific staff. Moreover, as there are several similar organizations involved, there was a need for a customized approach given the vastly different requirements and capacities.
- Sustainability of institutional capacity required enhancing the core management capacity of middle-level managers to ensure programme continuity in light of frequent turnover at the senior management level. It also required identifying sources of revenue that would cushion them against year-to-year budget uncertainties.

- Outreach to SME polluters required a multi-dimensional approach. The key elements of the outreach programme included: (a) direct grants for partial financing of CETPs serving conglomerates of small scale manufacturers; (b) extension and technical assistance services supported by MOEF; (c) financing of pre-investment studies to identify key environmental problems and effective solutions; and (d) industrial zoning to cluster similar industries in an effort to gain in economies of scale for providing utilities and environmental services.
- There is a need to strengthen the technical capacity of financial intermediaries before opening lines of credit and to ensure that there is strong management commitment to making loans for pollution prevention and control. Related to this is the need for donor coordination to harmonize credit terms with similar lending operations financed by different donors.
- In recent years, the Bank has not extended new lines of credit through development finance institutions for environmental purposes on the grounds that in most countries (and certainly in India) the private sector now has adequate access to other sources of capital. However, the strengthening of national development financing institutions is still needed particularly since other donors continue to provide finance for lines of credit for environmental investments.

4.2. Economic incentive — LSPC — UNIDO

- Since the problems and challenges differed substantially from region to region, the design of the leather tanning programmes needed to differ as well. Much of the Asian programme was focused on environmental management because of the more advanced state of the production process, whereas the African programme was initially focused on improving productivity and product quality.

- When it comes to choosing EOP or CT options to reduce pollutant discharge, the efficacy of each approach should determine the order of their adoption. In the leather tanning industry, it is most important to establish successful EOP technologies and simple and low cost CT options. Once those are functioning well, then the focus and the finances can be transferred to implementing more technically complex CTs, which are more beneficial in the long run for both industry and stakeholders.
- Environmental programmes cannot function without full cooperation with counterpart agencies, and the stakeholders involved. Even though workshops and training sessions help tanners understand the problems of pollution, there is always a need for stakeholder pressure to implement environmental controls, be it by government regulators, market standards or community involvement.
- While the need for technical assistance for capacity building is rarely questioned, there exists a debate about how much United Nations agencies and national governments should be involved in funding the purchase of equipment and infrastructure to reduce pollutant loadings from the leather tanning industry. Since pollutant intensity is very high in the leather tanning industry and its reduction costly, it is often argued that some degree of subsidy is needed for construction of ETPs. The experience of UNIDO in the leather tanning industry has shown that it is always important to have an open debate with industry and counterpart institutions, particularly when it comes to financing the construction of ETPs and ancillary equipment.

4.3. Economic incentive— MF — MFS

- Today's challenges require the committed effort of numerous stakeholders willing to set aside their own narrow interests for the common good. That means forging

linkages, developing effective channels of communication, getting the right people mobilized, and taking the time to hear all points of view and develop consensus positions. However, it also means focusing that consensus on concrete action.

- Little can be done unless those responsible for carrying out initiatives have the proper understanding and training for what they are to do. What is more, ambitious initiatives also require prior implementation of appropriate regulatory frameworks, which are able to encourage and support action. That in turn means that effective implementation requires a presence on the ground and close linkages with actors in recipient countries.
- Effective international action also demands secure and predictable funding. The MF has been a success because donors honoured their commitments. It has also succeeded because it was flexible in the way it used funding, moving from individual projects to national strategies, and experimenting with alternative funding mechanisms where appropriate.
- MF investment projects have shown the potential of a multilateral environmental agreement not only to meet its stated environmental objective, but also to contribute to the economic and social dimensions of sustainable development. In thinking about other and yet-to-be implemented multilateral environmental agreements, one can see the need for expanded project design guidance for Global Environment Facility (GEF) funded projects, particularly those that support the focal areas of climate change, international waters, ozone depletion and persistent organic pollutants, to ensure that they make the maximum contribution to all dimensions of sustainable development.

4.4. Voluntary action—NCPC—UNIDO/UNEP

- The diffusion of the CP concept can hardly unfold on commercial principles alone, particularly among SMEs, so that some element of promotion/subsidy is always needed, particularly in the beginning. This situation is not significantly different from how it is in most of the developed countries, which must subsidize CP centres to deliver services to SMEs too.
- The promotion of the CP concept needs to focus on services creating demand for CP. These services are primarily awareness raising, policy framework and access to finance.
- The more extensive uptake of CP by industry requires that it be included as one element among more marketable services normally offered by productivity centres, such as marketing, labour negotiation, process optimisation, quality management systems. CP could also be one among several environmental services, like pollution control, environmental management systems, corporate social responsibility programmes and green products. This suggests targeting the more advanced segment of the SMEs, particularly those receiving foreign capital and exporting their products, as they are more aware of the need for these services.
- While the technical bottom-up perspective in NCPCs has proven successful in the transfer of lower order complexity CTs, it has been significantly less so in the transfer of higher order complexity CTs. The adoption of more advanced technology is normally a top down commercially driven process. To be successful in this process, NCPCs need the skills to understand the commercial realities of their clients, to be able to draw on specialized knowledge of sub-sector specific technologies and to link with suppliers of cross-sectoral CTs.

- Access to finance is critical for implementing more complex technological changes and thus achievement of more significant economic and environmental impacts.

4.5. Voluntary action—CPTAL— ADB

- CP is largely driven by the behaviour of business decision-makers. CP requires thinking about the life cycle of consumption, production and distribution, and using the results of the analysis in design and operation. This behaviour must be promoted as good management, risk reduction, social responsibility and competitive advantage.
- CP implementation must be voluntary. Positive rather than negative drivers best encourage it. This means building demand in business and society for CP solutions by suppliers and producers, and ensuring that good CP performance is rewarded. Although CP can and does save firms money, most business managers are much more interested in generating revenues than in cutting costs. This is true even when it can be demonstrated that more bottom-line profits can be guaranteed from cost savings than from marketing to generate new customers. When business managers see that CP results in more sales, they will act on it.
- CP promotion must be strategic. Piece-meal, *ad hoc* promotional efforts, in particular demonstrations, are not cost-effective. There is no longer any need to prove that CP can improve the performance of firms. Now the need is to translate this fact into policies and projects that match the capacity of target economies and stakeholders, follow a sequence that builds demand and capacity before getting into technical solutions, and use sector- and place-based approaches to focus resources for maximum leverage.

- CP promotion must be collaborative. There are many stakeholders for CP that will need to participate to overcome the sheer inertia of resistance to change. CP centres should focus on catalysing behaviour change in other stakeholders, especially policy makers and community leaders, who can create the demand for CP improvements. CP centres can also help coordinate and share information among CP initiatives.
- Change accomplished through CP must be measurable. While firms are willing to try CTs because they hear through networking that other firms have found some benefit, they are unlikely to continue their effort over time unless they are able to measure their own achievements in some tangible manner. Not only must the techniques for achieving CP be available to them in readily understandable guidelines, they must have easily understood tools available by which they can measure their own progress and achievements.

4.6. Voluntary action—GRI —UNEP

- One of the factors of the GRI success was that it met a real and rapidly developing stakeholder demand. It filled a unique gap by being a reporting framework with its guidelines, protocols and sector supplements. In so doing it avoided duplication with others by not being a performance standard, an internal management standard or a code of conduct.
- The success of private transnational organizations that claim to be operating in the public interest depends on their openness and transparency. Throughout the process of developing the GRI guidelines, the initiative has functioned as a forum for participants of diverse backgrounds and interests to communicate their concerns while encountering a multitude of perspectives on environmentally relevant issues that benefit from a sustainable framework.

- Flexibility in reporting requirements was important for broad stakeholder acceptance of the GRI guidelines since it allowed both the business and civil society communities to accept them as the best currently available reporting procedures. To large extent, flexibility emerged because participants were exposed to diverging approaches to sustainability reporting and as result frequently widened their views as to what was realistically possible in the short run.
- There is great value in running an international multi-stakeholder process with private and public, profit and non-profit, interest group and campaign organizations involved. However, having a broad-based, global multi-stakeholder initiative also brings complications in governance and challenges finding the right integration of representation and expertise.
- The United Nations system can help convene multi-stakeholder forums, form partnerships and bring together complementary public and private funding. Where markets are hesitant to take the full risk or are held back by internal competition, the involvement of the UN and public agencies help ensure action is taken in the public interest.

4.7. Voluntary action—APELL—UNEP

- Industrial accidents and their resulting adverse effects are usually caused by the lack of knowledge or the failure to use it. Hence, learning from earlier disasters, and educating people involved in potential emergencies, are essential to reducing both the number of accidents and the negative impacts of potential accidents. Learning from past experience, the APELL programme has been able to provide an effective and well-structured system that helps communities and authorities to better prepare for emergencies.

- The major difficulty in dealing with emergency response and awareness is the fact that stakeholders lose interest in the accidents after there has not been a disaster for a long period of time. Therefore, it is crucial to set up institutions and legislation, which permanently ensure that a) industry has adequate safety standards to reduce the risk of accidents, b) governments have a systematic and effective approach to respond to accidents, and c) communities are well prepared if the worst should happen.
- The APELL programme is thought to be a good example of an effective global effort to deal with the problem of industrial accidents and other forms of disasters. The international community needs to further emphasize transnational cooperation (especially by sharing information), in order to help prevent accidents from happening, or to reduce their negative impacts.

4.8. Public disclosure—PROPER—World Bank

- Indonesia's PROPER programme not only significantly improved the environmental performance of plants in an extremely cost-effective way, but it also offered an innovative approach to industrial environmental management with high sustainable potential. The programme's clear concept and simple structure has a high political appeal and hence has been readily adopted by other governments.
- Public disclosure programmes based on the PROPER model are easy to launch but difficult to institute without a well-prepared strategy early on. Ministers of Environment need to be willing to make a PROPER type programme the core programme for industrial pollution control in their agencies. Often Ministers have used PROPER for the media attention, but failed to see it in strategic terms.

- Institutionalisation of the PROPER type programmes at the operational level of the Ministry is critical for its long-term sustainability. This is the key to the long-term success because both the leadership and international support are only short-lived, but it is the middle level management in a bureaucracy that remains and ultimately defines the character of an environmental agency.
- Technical assistance and international recognition played an important role in setting up and sustaining the PROPER programme. The World Bank first provided consistent support in 1995-96, USAID in 1997-98 and then the World Bank again between 2002 and 2005. But more importantly, World Bank research and publications managed to put the PROPER programme on the international map.

Common themes among the lessons learned are hard to discern, so each lesson learned was summarized by a few words and placed in a simple matrix (Table 8). Clearly, cooperation and financing are important for the success of many programmes. Also, being demand driven is central for the success of some programmes. Additional refinement of the lessons learned and an agreement on a common vocabulary would most likely reveal additional common themes.

Table 8. Overview of case study insights

Programme	Insights				
IPC	Long term institutional support essential	Sustainability of funding for effective regulatory effort	Multi-dimensional services needed for SMEs	Effective financing	Capacity building needed for financial institutions
LSPC	Customized approach to countries	Complex choice between CTs and ETPs	Cooperation among stakeholders	Extent of financing required varies	

MF	Cooperation and networking essential	Capacity building	Reliable donor funding	Orchestrated design	
NCPC	Government financial support needed	Lack of demand for services	CP as part of industrial extension services	Top down commercially driven process	Better access to financing needed
CPTAL	Commercially driven	Voluntary implementation	Strategic promotion	Collaboration among stakeholders	Measurable results
GRI	Significant stakeholder demand	Transparency in operations	Flexibility in reporting requirements	Cooperation among stakeholders	UN system leadership
APELL	Programme based on past experience	Sustaining community interest difficult	Information sharing is essential		
PROPER	Clear concept and simple structure	Sustaining management interest difficult	Training of mid-level bureaucracy	Technical assistance and international recognition	

5. General Observations

Several issues, which emerged as the issue paper was written, are discussed in this section. Since they relate to problem definition, programme response and periodic verification, they are addressed under these three headings.

5.1. Problem definition

Internally consistent international data for industry on global pollutants and energy use are available, only limited data are available on water use and no data are available on conventional pollutant loadings. UNFCCC assembles national inventories of CO₂ emissions and other greenhouse gases and the Ozone Secretariat assembles national inventories on the consumption and production of ODS submitted to the Secretariat by national ozone units. The Stockholm Convention Secretariat expects to receive national data on the release of POPs from around 100 countries by the end of 2006 as a result of the preparation of national implementation plans. IEA regularly receives data from most countries on national energy consumption, including data on the manufacturing sector and its many sub-sectors, and uses these energy consumption data to estimate CO₂ emissions. The FAO estimates and verifies, to the extent possible with national data, water use by the industrial sector at ten-year intervals as part of its programme to collect data on agricultural water use. No agency within the United Nations system assembles national data on conventional pollutant releases from industry, however. The only information available is estimated data for one conventional pollutant, BOD loadings, which are calculated by the World Bank.

The seriousness of human health and environmental damages caused by conventional pollutants suggests that the United Nations system should encourage developing countries to

strengthen their efforts to collect at source data on pollutant loadings and to provide that data to the United Nations Environment Programme. Currently only a few developing countries, such as Brazil and China, are consistently and regularly collecting at source data on pollutant releases by industry. As shown in this report, the United Nations system is actively supporting various capacity building efforts to improve the environmental performance of industry in developing countries, but it is doing so with virtually no information on the total magnitude, sub-sectoral composition or geographical distribution of pollutant loadings. Lacking such information, members of the United Nations system can neither design cost-effective programmes nor target funds on the more serious problems, some of which cut across national boundaries and thus could be addressed with funding provided by GEF.

5.2. Programme response

This review of selected efforts by the United Nations system and regional development banks to improve industrial environmental management indicates that they have so far focused primarily on some approaches to the neglect of others. Significant support is mainly provided for building capacity for command and control regulation and voluntary actions. While the United Nations system and regional development banks do not have readily available inventories of their initiatives to build capacity for command and control regulation for the industrial sector, they have made a considerable effort in this area. Furthermore, they support numerous efforts that encourage voluntary actions on the part of industry to improve its environmental performance. These efforts by and large are building public sector capacity in the case of cleaner production and directly encouraging multinational corporations and international banks to take into account the impact of industrial operations in developing countries.

Efforts by the United Nations system and regional development banks in support of economic incentive instruments are much less common than support for command and control regulation and voluntary action. For the most part, they employ only one of the many economic instruments, i.e., subsidized investments by MF and GEF and lines of credit from the World Bank and regional development banks. To a much lesser extent, UNIDO with support from UNDP and bilateral donors subsidizes primarily engineering services and limited capital investments in pollution control equipment for the leather tanning sub-sector. More recently the United Nations system is encouraging the use of emissions trading and emission credits as mechanisms to implement the Kyoto Protocol.

Missing among the United Nations system and regional development bank support for economic instruments are programmes that enhance national capacities to levy fees and use trading regimes as complements to command and control regulatory systems. A few developing countries are experimenting with these economic instruments, primarily levies on pollutants and solid wastes, but have received little or no support from the United Nations system in undertaking and sustaining their use (USEPA, 2005). Some experiments have design flaws as evident from the use of a pollutant levy in China, and others have not been institutionalised after the initial experiment, as was the case in the Philippines.⁷ In the course of preparing this report, no long-term programme on the part of the United Nations system or regional development

⁷ The most widely used economic instrument in China, for example, is a pollution levy system (PLS) that imposes a fee on pollutant concentrations that exceed the standards. This fee varies depending on the difference between actual concentrations and the standards. Provincial and city Environmental Protection Bureaux also levy tariffs on wastewater treated and solid waste and, in some cases, apply environmental taxes on all pollutant discharges, even those within the pollutant concentration limits. The primary limitations with this approach are that the levy is applied only to the pollutant on which the assessed penalty is the highest and the applicable rate of the levy system is too low, resulting in minor effects on enterprise performance. Additionally, the revenue from the taxes are used to support EPB activities, which is a disincentive to vigorously encourage pollutant reduction. Reduced levels of pollutant discharge would result in a decrease in operational funds for EPB activities. In spite of these limitations, Wang and Wheeler (2000) found that plants have slightly reduced their pollutant discharge in response to the levy.

banks could be identified that aimed to enhance national capacity to use economic instruments as a complement to national command and control regulation.

Efforts by the United Nations system in support of public disclosure or transparency approaches have been limited to PROPER in Indonesia and a few follow-up efforts based on the PROPER model. Public disclosure programmes of this type obviously have real potential to improve the environmental performance of industry. However, without long term capacity building of the type provided by the World Bank (as well as USAID), the imitation cases have been one, or at the most, two time events rather than sustained efforts.

Furthermore, efforts of the United Nations system to build national government capacity to incorporate environmental considerations into industrial development policy remain very limited. The only significant effort in this area that was found by authors of the issue paper was the UNIDO project in China that was briefly described in annex 1. Given the urgent need, often stated since the release of *Our Common Future* (1988) to incorporate environmental (as well as social) considerations into developmental policies of various kinds, it is surprising that so little integrative effort appears to be realized in this area.

Lastly, as the terms of reference for the issue paper called for a review of inter-agency activities, it is worth commenting on the extent to which agencies have actually worked together to improve industrial environmental management in developing countries. On the one hand, there are instances of United Nations agencies working together to phase-out ODS, to prepare Stockholm Convention national implementation plans and to implement the NCPC programme. With MLF funding, UNDP has collaborated with the World Bank and UNIDO in putting forward a national phase-out strategy in Indonesia. With GEF funding for preparing a national implementation plan in China, UNIDO is involving UNDP to address pesticide use and the

World Bank to address PCB use. Lastly, UNIDO and UNEP together designed, secured the funding for and are now managing the NCPC programme that is operating in more than 20 countries.

On the other hand, there are situations known to the authors where agencies in the United Nations system and the regional development banks case studies have missed opportunities to work together. Both UNIDO/UNEP and ADB are funding cleaner production programmes in China as country specific examples of their work described in the two case studies, yet there is only limited collaboration between them and their respective counterpart institutions in China. There was only limited collaboration or information sharing between UNIDO Area-wide Environmental Management (AEQM) project and the World Bank Metropolitan Environmental Improvement Project (MEIP), both described in annex 1 during their implementation of regional environmental planning projects in Viet Nam. Perhaps the lesson that can be learned from these experiences is that there is a high probability of collaborative efforts in the field, when executing agencies with common programmes and capabilities depend on a common source of funds, as is the case of MLF funding national ODS phase-out strategies and GEF funding national implementation plans or when they participate in the common design and secure funding for a programme as is the case for the NCPC programme. Conversely, there is a low probability of information sharing and collaborative effort when agencies can draw upon separate sources for funding projects.

Given the success of the GEF in securing inter-agency cooperation in support of the Stockholm Convention, it is surprising that the GEF is not promoting inter-agency cooperation and support for the preparation of strategic planning for another important avenue for improving industrial environmental management i.e. industrial energy efficiency. Admittedly, GEF funds

are being used to enable developing countries to complete their National Communications as required by the Climate Change Convention. However, most of the effort in preparing National Communications goes into preparing greenhouse gas inventories. There is rarely more than just a statement of intent to improve energy efficiency or develop renewable energy resources. GEF should require that preparation of National Communications be more like the national phase-out strategies for ODS funded by MLF. Using more rigorous planning procedures and drawing on the expertise of several United Nations agencies has the potential to increase inter-agency cooperation and to result in more cost-effective investment of GEF funds for climate change mitigation.

5.3. Periodic review

In preparing the issue paper on United Nations system and regional development bank initiatives in the field of industrial environmental management, the authors of the issue paper looked for periodic reviews of their technical cooperation and lending activities in the field of industrial environmental management. The closest effort to a periodic review that was identified is a country environmental analysis (CEA), which is a systematic evaluation of the environmental priorities at the country level. The CEA is a diagnostic tool for evaluating the consequences on the environment of national policies, and the country's capability to deal with their priorities.

The main elements for a CEA are shown in Table 9 below:

Table 9. CEA building blocks

CEA building blocks		
Country Environmental Analysis		
Environmental Priorities for Development	Policy Analysis	Capacity/Performance Assessment
Key environmental and sustainability indicators with focus on priority issues identified by NEAPs national strategies, or other previous documents	Identification of key macroeconomic or sector policies and reforms that may have significant environmental implications (e.g., energy and water pricing issues, privatization, trade liberalization)	Institutional and organizational capacity assessment
Environmental trends in priority areas and sectors	Lessons from strategic environmental assessments	Methodology and processes for priority setting and cross-sectoral coordination
Links of environmental issues with economic growth and poverty reduction (key environmental and poverty indicators)	Suggested measures or areas for strategic environmental assessments	EA capacity assessment
Data gaps		Environmental public expenditure review
		Indicators for measuring public sector capacity
		Data gaps
		Areas for intervention

Source: Segnestam, L., et al.. "Country-Level Environmental Analysis. A Review of International Experience". Environment Strategy

Papers. World Bank. Washington, D.C. July 2003.

Since 2002, the World Bank and the Asian Development Bank have prepared a number of CEAs as pilot projects. The Asian Development Bank has prepared 17 CEA reports over the last two years, while the World Bank has been involved with over a dozen CEA projects for the last 3 or 4 years, which are regarded as pilots (around 5 have been completed, 15 ongoing and a number have already being planned to be executed).

CEA as used by both the World Bank and the Asian Development Bank is a systematic diagnosis tool at the country level. Given this approach, the CEA reports from the ADB include only brief information on industry; between a paragraph and two pages are focused on the urban and industrial sector together. The WB's CEA reports do not include sections focused on the

industry as such, but mention it randomly, where appropriate, in many sections of the CEA reports. In both cases, CEA reports have a general focus on resources, institutional and legal framework and policies of the country; industry assessments as such are only briefly included in CEA reports.

While acknowledging the role of CEA, the authors of the issue paper think that a more comprehensive and catholic approach is needed to improve the cost effectiveness of efforts to assist developing countries improve industrial environmental performance. The authors suggest an integrative initiative on the collective level. The initiative would consist of three basic steps for any country: (1) an impartial and comprehensive review of the already existing national capacity for industrial environmental management, (2) an inventory and critique of various programmes and projects recently completed or underway funded by the United Nations system and regional development banks (preferably also those funded by bilateral donors) and (3) preparation of proposals for improving national capacity, which draw on the United Nations system and regional development banks capacity to provide technical advice and investment funds. For the most part, only lists of recent and on-going technical cooperation projects and loans for industrial environmental management are currently available, compiled usually by UNDP or the World Bank. There is no overall evaluation or assessment of the extent to which the collective effort of these projects and loans has enhanced the capacity for industrial environmental management.

Integrating its collective resources to enhance industrial environmental management will require the United Nations system and regional development banks to undertake environmental performance reviews similar to those OECD has undertaken for its member countries and more recently for developing countries, Chile in 2005 and China (forthcoming in 2006). An OECD

environmental performance review consists of a systematic examination and assessment of the extent to which a country is meeting its domestic policy objectives and international commitments. As enumerated by the OECD, ‘the principal aim of OECD performance reviews is to help member countries improve their individual and collective performances in environmental management’ (OECD, 2003:46).

The United Nations system and regional development bank periodic review proposed here would be more narrowly focused and yet more comprehensive than an OECD performance review. It would be more focused in that it would examine industrial environmental management only in order not to dilute the review. An attempt to include too many aspects of environmental and even natural resource management would most likely lead only to superficial insights. However, it would be more comprehensive in that it would examine and assess all donor efforts aimed at improving the capacity for industrial environmental management. Hopefully the combination of an in-depth examination of current capacity and a realistic assessment of what has been provided to date by the United Nations system and regional banks would form the basis for identifying best practices and cost effective actions to further improvement industrial environmental management.

Among other things, an environmental performance review could be a major contribution to the national sustainable consumption and production agenda called for in the Johannesburg Plan of Implementation. The Plan requested national governments to formulate ten-year framework programmes that would ‘accelerate the shift towards sustainable consumption and production needed to promote social and economic development within the carrying capacity of ecosystems’ (WSSD, 2002: 15). So far little progress beyond meetings (the Marrakech process) has been made in implementing such framework programmes, particularly in regard to the

resource-use intensity of industrial production. An industrial environmental performance review could identify the capacity needs and recommend feasible sources of finance to hasten implementation.

ANNEXES

Annex 1: Programme Summaries

Programme summaries of seven United Nations System initiatives that have contributed to the capacity of developing country governments to improve the environmental performance of industry or that have directly influenced the environmental performance of industry are included in this section. Two initiatives focused primarily on building capacity for command and control regulation and are included because enhanced capacity in this area is an essential building block for effective environmental management. A third initiative is concerned with financing environmental improvements in developing countries. It is included because it is the principal source of international funding for addressing many global environmental concerns. Two initiatives of a voluntary nature show the United Nations System working with the private sector to improve the environmental performance of industry in developing countries. A sixth initiative is also an example of a voluntary nature that is supporting the use of environmental management systems. A seventh initiative is one that aimed explicitly to integrate environmental considerations into policy formulation and planning for industrial development.

1.1.1. Command and control regulation: The metropolitan environmental improvement programme in Asia—World Bank⁸

The Metropolitan Environmental Improvement Programme (MEIP) was a pilot programme that aimed at finding innovative solutions to the environmental problems of Asian cities. In 1989, the World Bank and the United Nations Development Programme established MEIP to help selected metropolitan areas design and implement practical solutions to rapidly

⁸ World Bank (1999)

growing environmental problems. Between 1989 and 2000, MEIP undertook activities in Bombay, India; Colombo, Sri Lanka; Hanoi, Vietnam; Jakarta, Indonesia; Kathmandu, Nepal and Metro Manila, Philippines as well as secondary cities in some of these countries. The programme contributed to improved industrial environmental management in two ways. First, it strengthened the institutional and legislative framework for environmental management, planning, monitoring and enforcement. Secondly, it supported activities directed at reducing pollution from industry, primarily information dissemination and cleaner production assessments.

1.1.2. Command and control regulation: Area-wide environmental quality management in Viet Nam — UNIDO⁹

During the mid-1990s up until 2001, UNIDO implemented three Area-wide Environmental Quality Management (AEQM) projects in three different provinces in Viet Nam (Phu Tho, Dong Nai, and Ho Chi Minh City). The projects aimed to build capacity for industrial environmental management at the provincial level of government. Though the outcomes varied considerably, the aim of the projects were similar in that they attempted to (1) monitor industrial pollutants and environmental quality, (2) develop and secure approval of a pollution control strategy, (3) strengthen environmental enforcement capacity, and (4) encourage voluntary compliance of industry in reducing waste discharges.

Between the first two projects, the one in Dong Nai (1996-1998) was more successful than the one in Phu Tho (1996-1998). The former established a more solid environmental management foundation by integrating economics, ecology, technology, and institutional factors. In addition, it improved communication between government agencies, donors, and the general

⁹ Taken from UNIDO (1997, 1998 and 2001)

public. However, its geographic coverage was too broad for the existing institutional capacity and its period of execution too short to develop the full range of capacities needed. The one in Phu Tho was constrained by several administrative changes and by the Government splitting the province in two during the period of project implementation.

For the most part, the Ho Chi Minh City project (1998-2001) was successful, largely due to a capable and committed national project team and the effective transfer of technology by national and international experts. It achieved its performance targets for functional air and water monitoring networks and an environmental data centre. It exceeded the targets for numbers of people trained and regional cooperation, but did not meet expectations regarding outreach to SMEs. In addition, there was a deficit in regards to community awareness, which was due, in part, to a lack of transparency among government agencies.

1.1.3. Economic incentives: The Global Environment Facility—the GEF Council¹⁰

The Global Environment Facility (GEF), established in 1991, helps developing countries finance projects and programmes that protect the global environment. GEF grants support projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. Since 1991, the GEF has provided US\$ 4.5 billion in grants for more than 1,300 projects in developing countries and countries with economies in transition.

GEF projects are managed by three GEF Implementing Agencies — the United Nations Environment Programme, the United Nations Development Programme and the World Bank. Seven other international organizations, known as GEF, contribute to the management and execution of GEF projects—the African Development Bank (AfDB), the Asian Development

¹⁰ Taken from the official website of Global Environmental Facility.

Bank (ADB), the European Bank for Reconstruction and Development (EBRD); the Inter-American Development Bank (IDB); the International Fund for Agricultural Development (IFAD); the UN Food and Agricultural Organization (FAO) and the UN Industrial Development Organization (UNIDO). All three implementing agencies, the regional development banks and UNIDO are undertaking GEF-funded projects whose primary purpose is to reduce pollutant discharge from industry that is adversely affecting the global environment.

1.1.4. Economic incentive: Clean Development Mechanism – CDM Executive Board¹¹

The Clean Development Mechanism (CDM) is one of the flexibility mechanisms of the Kyoto Protocol that Annex I parties can use to increase the cost-effectiveness of climate change mitigation actions. Specifically, the CDM is designed to: (a) lower the cost of reducing greenhouse gas (GHG) emissions, and (b) support sustainable development projects in non-Annex I countries. The CDM promotes coordination between developed (Annex I) and developing countries in achieving the common objective of reducing the accumulation of GHGs.

A fundamental feature of the CDM is that it allows the industrialized countries to invest in low-cost emission reduction activities in developing countries, thus contributing to sustainable development, and to receive credits for the emission reductions resulting from such activities that can be used against their 2008-2012 targets. The main principles are that: (a) several abatement opportunities are less expensive in developing countries, and (b) the contribution of GHG emissions to climate change is the same irrespective of where such emissions occur.

The benefits for developing countries come from the increased investment flows and from the specific requirements for CDM projects to both offset GHG emission and achieve sustainable development objectives.

¹¹ Taken from FAO and UNFCCC official websites

The first project was registered on 18 November 2004 and is located in the state of Rio de Janeiro, Brazil. It aims to reduce greenhouse gas emissions from a landfill site by capturing methane to use it for generating electricity, thereby yielding direct health and environmental benefits for the local community of Nova Iguaçu. It is expected to reduce about 31,000 tons of methane per year, which in terms of global warming potential, is equivalent to a reduction of 670,000 tons of CO₂.

To date, there have been 68 projects initiated across 22 different countries, which demonstrate its potential to effect change. In pursuing development actions, the CDM recognizes that the ability of all countries to play an active role on climate protection depends primarily on long-term development perspectives involving developed and developing countries alike.

1.1.5. Voluntary action: The Equator Principle—International Finance Corporation¹²

At the request of a number of international banks, the International Finance Corporation (IFC) began deliberations with them on establishing the Equator Principles in October of 2002. As of March 2004, twenty international banks (e.g. Citigroup, Credit Suisse Grp, Barclays, HSBC, and JPMorgan Chase) had voluntarily adopted these principles that aimed to establish uniformity in the process of financing projects that exceed US\$50 million in emerging markets across all industry sectors. Projects will be placed in one of three risk categories; those falling in the two higher risk categories are then subjected to an environmental impact assessment. Both banks and customers are obliged to transfer information that is necessary to properly assess whether a project falls in line with the Equator Principles. If standards are not met, ultimately the bank has the authority to declare the project loan in default.

¹² Taken from the official website of Equator Principle.

Along with the World Bank's pollution prevention guidelines, which are more sector-specific, the two efforts will form a complimentary relationship that will hopefully mitigate the traditional criticism against these actors en route to solving the most egregious abuses associated with financing development projects. In the end, it is hoped that these efforts will lead to the formulation of a *de facto* industry standard, whereby smaller lending institutions will feel inclined to climb aboard. However, there are a number of salient pitfalls in that there is no independent monitoring mechanism to ensure compliance, the disclosure of project data is at the bank's discretion, and the implementation mechanisms are wholly left up to the banks. Nonetheless, it represents an effort in the right direction in that many of the major players in the banking industry have openly acknowledged their collective role in creating a more sustainable development.

1.1.6. Voluntary action: Management and Productivity in Colombia—Inter-American Development Bank ¹³

The Corporación para la Investigación Socioeconómica y Tecnológica de Colombia (CINSET) was created as an NGO in Colombia in 1987 by a group of 35 SME leaders that were members of ACOPI (Colombian Small and Medium-Size Enterprise Industry Association) to serve as a think tank for SMEs in the country. CINSET was supported by the Multilateral Investment Fund (MIF) of the Inter-American Development Bank (IDB), the Konrad Adenauer Foundation, environmental authorities, and local entrepreneurs to implement an Environmental Management and Productivity Project (GA+P) between 2001 and 2004. The aim of the project, and similar ones executed in eleven other countries, was to influence a paradigmatic shift away from the idea that proactive environmental management is in direct conflict with economic

¹³ Multilateral Investment Fund (2004)

growth and business competitiveness to one that sees these two inextricable development aspects as mutually beneficial.

The results of collaboration between the MIF/IDB and CINSET on the GA+P project are easily quantifiable. Seventeen specialized publications were produced, counting both sectoral manuals and publications aimed at consultants; a CD for environmental self-assessment for entrepreneurs and 12 GA+P bulletins. Technical assistance was provided to more than 525 SMEs, and some 230 environmental consultants were trained in SME and CP issues by the programme. Finally, about 10,000 entrepreneurs received information and training, with a focus on the idea that many business solutions to improve competitiveness are possible through good practices such as those implemented in the GA+P project.

The ability of CINSET to make use of synergies; an intimate understanding of the micro, small and medium-size business sector; the ability to establish inter-institutional and multi-sectoral alliances; and the efficient leverage of resources are the four cornerstones of its effective implementation of the project. Over the life of the project, CINSET's profile underwent some changes, the most notable of which were a significant geographic expansion and deepening. In the end, however, CINSET recognizes that shaking the incumbent paradigm in the country requires additional efforts and resources, an even wider network of participants, and broader information dissemination among SMEs.

1.1.7. Voluntary action: The Global Compact—the United Nations¹⁴

The Global Compact was launched by United Nations Secretary-General Kofi Annan at UN Headquarters in New York on 26 July 2000. It is a purely voluntary initiative, which aims to unite companies with UN agencies, labour and civil society in efforts to support ten universal

¹⁴ Taken from the official website of Global Compact.

socio-environmental principles that would create a more sustainable and inclusive global economy. The two main objectives are: (a) to mainstream its ten principles in business activities around the world and (b) to catalyse actions in support of UN objectives.

In order for the initiative to gain traction, there have been a number of facilitative mechanisms engendered, namely: policy dialogues, learning, country/regional networks, and projects. The fact that there exists no “hard” enforcement mechanism can presumably be seen as an advantage in that actors are more inclined to join the effort if it is not legally binding. Undoubtedly, keeping actors in varying degrees of cooperation with the initiative is viewed as more important, at least in the medium term, than a concretised compliance mechanism. The Global Compact relies on public accountability, transparency and the enlightened self-interest of companies, labour and civil society to initiate and share substantive action in pursuit of the Global Compact’s principles.

More recently, there have been efforts to deepen and streamline the initiative without compromising the administrative levity, which is at the heart of the Global Compact. Taking into consideration a range of suggestions from Global Compact stakeholders, the 2004 McKinsey report entitled, *Assessing the Global Compact’s Impact*, represents the next evolutionary phase of the initiative. Many elements of the Global Compact will remain unchanged; however there will be greater emphasis on quality control and safeguarding the initiative’s integrity. To promote greater ownership among the stakeholders of the Global Compact, a multi-centric governance framework will be introduced, whereby differentiated tasks will be taken on by six entities.

An annual “Communication on Progress” was initiated in 2003, which requires participating companies to openly communicate their implementation progress. Beginning in

July 2005, those who fail to comply will be regarded as inactive and thereby subject to a loss of Compact privileges. In addition, the Compact is becoming more embedded in the organizational structure of the UN itself through the formation of an inter-agency team that aims to pool expertise. Ultimately, the Compact sees itself as a compliment rather than a challenge to national and international regulatory instruments that will include, to a greater extent than ever before, a wide range of stakeholders in a multi-sectoral approach to sustainable development.

1.1.8. Industrial policy: Evaluation and adjustment of China's sustainable industrial policies and planning— UNIDO¹⁵

As part of its programme to provide industrial policy advice to Member States, UNIDO implemented a project to evaluate and adjust China's sustainable industrial planning and policies. The project counterpart was the Department of Development Planning of the State Development Planning Commission (now the National Development and Reform Commission of China). The project was executed in two phases- first at the national level of government and then at the provincial level (primarily Shaanxi and other provinces in the Western region) between 1999 and 2005.

The objective of the project was to establish at the State Development Planning Commission and other governmental institutions the capacity to design, formulate, implement, monitor and revise industrial policies to enhance the contribution of industry to sustainable development with a focus on those policies that could contribute to the Tenth Five Year Plan. The objective was to be achieved through four components—general capacity building, model development, case studies and integrated sustainable industrial policy formulation.

¹⁵ Taken from National Development Reform Commission and UNIDO (2004)

The first component involved a combination of analytical efforts carried out by inter-agency teams of national and international experts on competitiveness, employment and environmental policies as well as fellowships and study tours to learn from international experience. The objective of inter-agency involvement was to reinforce understanding and dialogue among several governments on sustainable industrial development.

The second component involved the development of a sector model with an environmental module for the automotive industry and the further development of an existing computerized general equilibrium model by adding an environmental module and regional (provincial) disaggregation.

The third component required the application of analytical skills enhanced as part of component one to four case studies, automotive, building material, energy and Daqing regional plan. As was the case with the other components, this component focused on the introduction of international experiences in several policy areas and exchange of policy analysis tools through close cooperation between national and international experts in analytical tools.

The fourth component involved an analysis of China's sustainable development planning and policies and a survey of international experience in this field. Recommendations focused on concrete areas for improvement that may be readily implemented and could be important steps that would enhance the contribution of industry to sustainable development in China.

Annex 2. Industrial Environmental Management Activities of the Agency Preparing a

Case Study (Only ADB and UNIDO have submitted programme overviews of a few

paragraphs. the annex will be deleted in the final report if there are not statements submitted by all organizations)

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