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**Cleaner Production Policy Activities:
A Comparative Review of
Four National Cleaner Production Centres**

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Introduction

In 1994, the United Nations Industrial Development Organization (UNIDO) and the United Nations Environment Programme (UNEP) launched the National Cleaner Production Centres Programme with the intent to promote cleaner production (CP) and cleaner technologies (CT) in developing countries.¹ The Programme currently has 25 participating National Cleaner Production Centres (NCPCs) around the world.

When the NCPCs were originally set up, UNIDO and UNEP encouraged them to develop Programme strategies and build capacity to offer core services in four areas:

- ◆ Raising awareness of cleaner production concepts within all levels of society, mainly through demonstration projects;
- ◆ Technical assistance through in-plant assessment of cleaner production opportunities and other environmentally related initiatives such as developing environmental management systems (EMS);
- ◆ Training of national experts on cleaner production methods, and other related topics such as EMS, energy efficiency, etc.; and
- ◆ Information dissemination by creating a support network at the national and international levels.

UNIDO and UNEP also intended for the NCPCs to become involved in the arena of public policy. Indeed, the policy work of the NCPCs was deemed to be so important that one measure of a centre's success would be a long-term commitment to cleaner production as reflected in additions or changes to a country's government policies. The "policy work" expected of NCPCs has always been understood to mean efforts to advance public policies that promote cleaner production (CP) at local, regional, and national government levels.² The original UNIDO project document supporting the establishment of the NCPCs calls for them to "serve a coordinating and catalytic role for cleaner production by *providing policy advice on environmental management...*" (emphasis added).³ The document also reflects the expectation that the NCPCs would commit to "[advising] governments, as needed, on policy and regulatory reforms that would encourage cleaner production." A subsequent UNEP project document underscored the expectation that policy activities would be integrated with demonstration projects in the NCPC Programme.⁴

¹ The NCPC Programme is a joint programme between UNIDO and UNEP. UNIDO is the executing agency running the project, contracting the international counterpart institutions, providing other technical experts, and managing the donor funds. UNEP is responsible for providing some training and information to the NCPCs.

² Clarence-Smith, E. National Centres: Delivering Cleaner Production. UNEP's 6th International High-level Seminar on Cleaner Production, October 2000.

³ UNIDO Project Document: Project for National Cleaner Production Centres (NCPCs) in Developing Countries—Phase I. Project Number US/INT/92/044, revised 1993.

⁴ UNEP Project document: Support to National Cleaner Production Centres, project number FP/1109-95-02, May 1995: "The approach to integrate policy studies with results of demonstration projects has been used and successfully evaluated in the UNEP/World Bank/NEPA China Cleaner Production project. UNEP plans to build upon this experience and on the results of the European PREPARE cleaner production

In striving to influence public policy, the NCPCs have faced several common challenges. The first challenge has been the lack of direction and instruction regarding their role. Despite the significance assigned to policy-related activities, UNEP's 1995 work plan for the NCPCs did not identify specific directions or tasks for the centres to undertake in this area (aside from 'one-day introductory seminars' for governments and research and development institutions). Nor did the document assign responsibility for helping centres develop their capacity to work in the policy arena. Nevertheless, there was a general understanding that UNEP would be responsible for helping the NCPCs develop a strategy for promoting CP integration into public policy, and that the policy component of the Programme would start a few years after the establishment of each NCPC so that the policy recommendations would be drawn from the experience and credibility of each NCPC in implementing CP projects in the field. The second challenge has been the perception that the NCPCs lack policy expertise. To overcome this perception, the centres have sought to establish their legitimacy as players in the policy arena by raising awareness about CP and building a network of stakeholders to strengthen support for CP policies. The third challenge has been the nature of policymaking itself. Because policy formulation is a slow and complex process, it has often been difficult for the NCPCs to see the tangible or quantifiable results of their policy-related efforts.

In order to help the centres expand their efforts in the policy arena, UNIDO has commissioned the research presented in this paper to learn more about the NCPCs' experience in providing policy advice and promoting policy change. This research has focused on what has been tried by various NCPCs, what has worked, and what challenges remain. The research highlights data collected from visits to centres in Brazil, the Czech Republic, Hungary, Mexico, and the Slovak Republic. The centres were chosen for this study based on their substantial experiences in the policy arena and the level of funding available for this project.

UNIDO contracted with the Lowell Centre for Sustainable Production (LCSP) at the University of Massachusetts Lowell to conduct the study. The Principal Investigator of this project, Dr. Jack Luskin, has been involved with the UNIDO/UNEP National Cleaner Production Centres Programme since its inception. Dr. Luskin has been an advisor to the Programme and has facilitated the Programme's annual meetings. Dr. Luskin has conducted training sessions for centre directors on public policy. The LCSP also has served as a formal International Counterpart Institution for Mexico in the National Cleaner Production Centres Programme.

The Co-Principal Investigator of this project, Dr. Ken Geiser, is an internationally recognized expert on environmental law and policy, clean production and sustainable development. Dr. Geiser served on the Core Advisory Group for the United Nations Environment Programme's Cleaner Production Programme. He has also served on the U.S. Environmental Protection Agency's Toxics Data Reporting Committee of the National Advisory Council for Environmental Policy and Technology, and the Agency's Common Sense Initiative for Regulatory Re-invention.

projects. The integrated approach will also be linked with a national dissemination strategy to ensure the multiplication effect of these results to other industrial sectors and governmental agencies.”

The editor of this report, Ms. Anne Berlin Blackman, is an environmental attorney with expertise in policy analysis and regulatory reform. She has assisted government agencies with the development, implementation, and evaluation of policy initiatives. Ms. Blackman and Dr. Luskin recently developed and delivered a training course for the National Cleaner Production Centres Programme on sustainable consumption and production.

Field work for this report was conducted by Ms. Nadia Haiama-Neurohr. Ms. Haiama-Neurohr has worked on several policy projects in Brazil and has collaborated with several cleaner production centres in that country. She holds a Master of Science degree in Cleaner Production and Pollution Prevention Policy.

The LCSP used the following methodology to prepare this report:

- ◆ Collect information about the public policy activities that all 25 centres have undertaken, with particular focus on the five centres identified above;⁵
- ◆ Evaluate the public policy activities that the staff of the mature centres would have liked (or would like) to undertake; and
- ◆ Elaborate conclusions as to how the strategies/activities of the centres could be modified to make them more successful in promoting CP policies, and how UNIDO and UNEP could better assist the centres in their activities to promote CP policies.

This Introduction is intended to provide background for and an overview of the research project. Chapter One summarizes the insights offered by centre directors at the annual NCPC Programme meeting in Seoul, Republic of Korea, in 2001. Chapter Two describes the findings from interviews with centres in five countries. Chapter Three provides a comparative analysis of the five centres' efforts to promote CP in policymaking. Chapter Four identifies potential ways to make the NCPCs' policy activities more effective, as well as ways to increase the support that UNIDO and UNEP provide the centres in this area.

⁵ The LCSP gathered background information on the NCPCs' policy initiatives during the Sixth Annual Meeting of the UNIDO/UNEP NCPC Directors held in Seoul, Republic of Korea on November 5-9, 2001. Preliminary interviews were conducted with several NCPC directors. These helped to set the context for the second step of the analysis, which involved visiting the five chosen NCPCs and conducting in-depth interviews of staff members and stakeholders.

Chapter One: Input from the 6th Annual Meeting of the NCPC Directors, Seoul, Korea

This study began with brief interviews with several NCPC directors at the 6th Annual Meeting of the UNIDO/UNEP NCPC Directors in Seoul, Republic of Korea, in September 2001. The purpose of these interviews was twofold: to solicit input from directors of the NCPCs that the LCSP would not be able to visit, and to help the LCSP shape its interview protocol for its site visits to five centres. This chapter summarizes the directors' comments on the following topics: policy strategies, incentives/opportunities for promoting CP, limitations/barriers to promoting CP, and the role of UNIDO and UNEP in supporting the centres' policy-related activities. Appendix B provides excerpts from the actual interviews.

1.1 NCPC Policy Strategies

Several NCPC directors discussed their centres' main strategies to integrate CP into the national government policies of their countries. A common approach has been to try to build consensus around CP through a variety of means: forming a national working group on CP, campaigning for the government to sign UNEP's International CP Declaration, or even drafting speeches for environment ministry officials. Another shared strategy has been to try to increase awareness about CP through training workshops or study tours for government officials.

Several directors noted the difficulty involved in trying to change existing laws, and they expressed a reluctance to devote scarce centre resources to this type of effort. However, they did articulate an expectation that their centres would work to extend the scope of existing regulations. Moreover, almost all of the directors indicated that their centres had been successful in integrating CP into specific national policies (e.g., sustainable industrial development policy, national CP action plan). The centres that enjoy particularly close relationships with government policymakers have also tried to integrate CP into fiscal policies (e.g., establishment of green grants program to help implement CP in industry).

1.2 Incentives/Opportunities for Promoting CP

The NCPC directors identified some existing incentives and opportunities for promoting CP within their countries. These include: specific government directives or laws, grant or loan programs to offset the cost of new technology, and university curricula that already include CP.

1.3 Limitations/Barriers to Promoting CP

The directors also laid out some of the important barriers to their work. The limitation cited most frequently was the cost of capital (particularly for SMEs) and the lack of funding to help industry invest in cleaner technology. Other barriers arise out of the culture or infrastructure of the host countries: e.g., lack of synergy in the environmental NGO community, lack of a tradition of professional networking, or hesitance to depart from traditional approaches to problem-solving. Governmental attitudes and practices can also pose challenges. Examples include: lack of communication between government agencies (e.g., Ministry of the Environment and Ministry of Industry), reluctance of governmental officials to take on “extra work,” inconsistent enforcement of existing environmental laws and regulations, and enforcement pressure on SMEs to focus on pollution control regulations.

1.4 Assistance from UNIDO/UNEP

A few NCPC directors made suggestions as to how UNIDO and UNEP could help the NCPCs do their work more effectively:

- *Provide targeted information to the NCPCs.* UNIDO and UNEP need to demonstrate how CP works in other countries. In particular, they should provide examples of economic tools and policy approaches that have worked elsewhere, with references and training.
- *Ramp up support regarding policy work.* A more institutionalised approach would help the NCPCs actually deal with policy issues. Directors need training in policy. UNEP and UNIDO should compile available information into more formalized policy studies.
- *Exert influence on host countries’ governments.* UNEP could seek to influence the Ministries of the Environment to promote CP, and UNIDO could likewise seek to influence the Ministries of Industry or Finance. They could send high-level representatives to meet with national policymakers about the importance of implementing CP incentives. They could also invite a small number of high-level government officials to the NCPC meetings to immerse them in the issues regarding the NCPCs’ work.
- *Support local efforts more visibly.* The presence of UNIDO and UNEP at high-level multistakeholder events that involve government officials could have a positive effect on efforts to promote CP.

Chapter Two: Country-Specific Findings

This section of the report summarizes the data collected during visits to the NCPCs in Brazil, the Czech Republic, Hungary, Mexico, and the Slovak Republic. Through in-depth interviews, the LCSP sought to identify the main types of policy strategies and activities developed by the NCPCs and other CP stakeholders, their opportunities and limitations to do policy work in their countries, and how UNIDO and UNEP could provide further assistance to the NCPCs in improving their capacity to influence policy decision makers in the future.

Using standardized semi-structured interview guides, the LCSP interviewed the following people: directors of each of the five centres, the UNIDO/UNEP coordinators, and representatives from the industry, government, academia, financial institutions, and non-governmental organizations (NGOs) involved with cleaner production issues in their countries. Key interview candidates were identified through the UNIDO/UNEP/NCPC networks. With a few exceptions, the NCPCs arranged all of the interviews in their respective countries. The interviews were conducted in English (Central Europe), Portuguese (Brazil), and Spanish (Mexico).

This chapter is organized by country and then by subtopic. For each centre, the chapter describes activities that are directly related to policy formulation (“policy advice, analysis, and advocacy”) as well as certain activities that contribute to the policy formulation process in a less obvious way (“supporting activities”). The chapter also provides an overview of the incentives/opportunities and limitations/barriers that exist for each centre as it tries to promote public policy that favors cleaner production. The next chapter provides a comparative analysis of the findings from all five centres.

2.1 Brazilian National Clean Technology Centre (CNTL)

The Brazilian NCPC, or as it is called the National Clean Technology Centre (CNTL), was launched in July 1995. The CNTL is located in the South of the country in the city of Porto Alegre, State of Rio Grande do Sul (RS). The host institution is the State branch of the National Service for Industrial Learning (SENAI-RS).

At the time of the LCSP site visit (December 14-18, 2001), the CNTL had 8 full-time staff, as well as several external consultants hired on a project basis.

2.1.1. Policy Advice, Analysis, and Advocacy

Under the CNTL’s former director, Dr. Carlos Nascimento, the centre succeeded in establishing channels of direct communication with national and state legislators. In 2001, the environmental commission of the national legislature (Comissão de Meio Ambiente da Câmara dos Deputados) invited Dr. Nascimento to speak to legislators about CP concepts and techniques. While the commission did not propose any CP legislation *per se* as a result of Dr. Nascimento’s presentation, the presentation has influenced the integration of CP concepts into draft legislation pertaining to sustainable

development.⁶ At the state level, during his tenure as director of the CNTL, Dr. Nascimento participated in one of the environmental commissions of the RS legislature (Comissão de Meio Ambiente da Assembleia do Rio Grande do Sul) as a representative of the Industrial Federation for the State of RS (FIERGS). Dr. Nascimento's membership in this commission gave the centre the opportunity to provide input into the development of regulations regarding solid waste, pesticides, and incineration that were adopted by the State of Rio Grande do Sul.

In addition to participating in the legislative process, the CNTL has sought to work closely with state and national government agencies on defined projects to adopt the CP concept. The following examples illustrate the CNTL's project-specific approach:

- The CNTL actively participated in the discussions about the new National Solid Waste Policy to push for the inclusion of CP concepts and methods in the body of the text. This policy is currently under revision by the national Congress and awaiting approval.
- The CNTL has been invited to participate in discussions with state environmental agencies and other stakeholders to formulate a proposal to incorporate CP into national legislation as a prerequisite for obtaining new industrial licenses and/or renewing operation licenses.
- The Ministry of the Environment invited the CNTL to participate in the MERCOSUR Working Group Sub-Group Six on the Environment.⁷ At the moment, the MERCOSUR environmental working group is discussing the possibility of promoting CP in SMEs with funds from the German Society for Technical Cooperation (GTZ) as a way to enhance their competitiveness. The CNTL has been appointed as the technical coordinator for this project.
- The CNTL presented a proposal in conjunction with other national stakeholders to the Ministry of the Environment to finance a study for the development of legal instruments to promote cleaner production through the National Environmental Programme.
- The centre is working with the State of Rio Grande do Sul to negotiate a program that would offer financial aid to industry that wants to adopt clean technology.⁸

⁶ Telephone conversation between Prof. Luis Felipe Nascimento (Universidade Federal do Rio Grande do Sul) and Dr. Carlos Nascimento, 11/20/02.

⁷ MERCOSUR is a treaty among 6 countries; Argentina, Bolivia, Brazil, Chile, Paraguay, and Uruguay, with the intent to integrate their economies through a harmonization of their market economies and pertinent laws and regulations.

⁸ The Pro-Guaíba program is a huge development project of the State of RS to recover the hydrographic region of Guaíba. It receives funds from the Inter-American Development Bank through the National Development Bank (BNDES). One of the program's major targets is to reduce industrial pollution into the hydrographic region through the use of clean technology. According to the project director, there is a potential list of more than 40 companies that would be interested in a special credit line from the national development bank to promote CP and technological modernization. In the past, a credit line program was put on due to unfavorable economic conditions prevented from offering below-market interest rates. The economic situation seems to have improved, so the CNTL and other stakeholders are resuming the negotiations with BNDES.

The CNTL has also engaged in efforts to shape policy at a more general level. The CNTL has been lobbying different Ministries (Ministry of the Environment, Ministry of Science and Technology, and Ministry of Foreign Affairs) to have preventive measures incorporated into national legislation. The centre has already received government funding to develop the basis for an environmental policy that will shift the paradigm of industry compliance from frequent adjustments to incremental changes in parameters to a CP-first approach. Finally, the CNTL and other institutions (including a government research and development institution and an industry association) are negotiating a project to provide capacity building training on CP to State Environmental Departments.

2.1.2. Supporting Activities

The CNTL has sought to influence policymaking more subtly through other types of projects (e.g., information dissemination and demonstration projects) that will lay the foundation for future high-profile policy work, even if they may not affect policy in the short-term. A good example is the CNTL's work to raise awareness in all levels of government about CP and the benefits that accrue from CP. For example, the centre is working with a local Congressman to organize a CP seminar for the local council in Porto Alegre, State of Rio Grande do Sul. In some cases, these awareness-raising efforts have helped bring about changes in government agencies' funding priorities – which reflect, to some degree, a shift in the agencies' thinking about CP. For example, one federal agency subsequently funded a large multi-stakeholder project to train and assist 300 enterprises from the shoe manufacturing sector to reduce the generation of solid waste at the source.

2.1.3. Opportunities for and Barriers to Promoting CP

This section describes some of the additional opportunities and barriers facing the CNTL as it works to promote CP at the national, regional, and local levels.

- The CNTL has received national funds to build CP capacity in Ecuador, as part of the Brazilian government's MERCOSUR activities. This arrangement presents the centre with the opportunity to advocate for the adoption of CP policies at a transnational/continental level, which would in turn influence the formulation of CP-friendly policies within Brazil.
- The State of Rio Grande do Sul environmental protection agency has been actively involved in promoting preventive actions inside industry by providing sector specific manuals on process optimisation. The CNTL has served as a technical expert to the agency. This arrangement provides the centre with an opportunity to leverage broader-based policy changes favoring CP in the state, whose environmental laws and regulations are generally progressive. Specifically, the CNTL may be able to carve out a role for itself in the development of programs to operationalize existing CP-related policies in the state, such as a 1998 decree that calls for industrial pollution prevention and a disposable packaging take-back law.

- An existing financial arrangement offers the potential for the CNTL to expand its human resources. The Ministry of Science and Technology (MCT) has granted scholarships called the ‘Recursos Humanos para Atividades Estratégicas’ (RHAE) to professionals to be trained by the CNTL and then to develop CP projects with the Centre. Whether this scholarship program will be able to help expand the centre’s policy capacity is unclear, however, for two reasons. First, the original idea was to have these professionals be hired by the centre’s host institution, SENAI, in order to serve as a resource to industry. However, many scholarship recipients were lured away by the better salaries available in the private sector. Second, it is not clear whether the funds would be available to train professionals in policy-related fields as well as technology-related fields.
- Brazil lacks a coordinated scheme to provide grants and loans to industry to adopt CP.⁹ Funding agencies have claimed that so far there has not been a demand for the existing funds, either due to the country’s unfavourable economic situation or to lack of knowledge in industry about CP and CT. However, a university professor has asserted that the government’s green credit lines (e.g., FINEP Verde) have not succeeded because their interest rates were about the same as the market ones and therefore were not financially attractive to industry. The centre has the opportunity to try to influence national and state policy to put in place appropriate funding mechanisms that will provide an incentive to industry to adopt CP more widely.
- Similarly, the centre should actively engage in the ongoing discussions being conducted by the environmental protection agency of the State of Rio Grande do Sul about the possibility of differentiated tax treatment for industries that adopt CP.
- The culture in place inside environmental government institutions is still based on a command-and-control approach that promotes end-of-pipe technological solutions. This culture weakens the CNTL’s capability to work with the public sector.
- Resource limitations have constrained the CNTL’s effectiveness in promoting CP. Consequently, the centre has made efforts to work with industrial sectors, not just individual companies, to increase the impact of its activities.
- Industry attitudes pose a challenge to the CNTL’s efforts to promote CP. First, there is still a great lack of knowledge about CP within industry despite the CNTL’s efforts in the field. Second, in general, Brazilian industry considers its end-of-pipe approach to be an investment in environmental protection. The

⁹ The Brazilian Service for Support to the Micro and Small Enterprises (SEBRAE) is the main source of funding for the CP network coordinated by Brazilian branch for the World Business Council on Sustainable Development (CEBDS), although the Banco do Nordeste, a regional bank, is also funding the two local CP centres in the Northeast region, and the Environmental Secretary of Rio de Janeiro will fund the centre there. The Ministry of Science and Technology, which has been financially supporting the CNTL since its inception, has some potential funding to conduct pilot projects as a follow-up Programme for CP projects within industry sectors.

CNTL has to argue that CP is primarily about reducing costs, and that environmental protection is an added benefit.

- The general policy within the CNTL's host institution (SENAI) had been that operational units (like the CNTL) should achieve a 0.85 ratio of expenses over revenues. In other words, the CNTL should bring in \$100 for each \$85 spent. Fortunately, this pressure from SENAI to be profitable has abated because SENAI has come to understand that some actions designed to support industry (such as policy-related work) will not have an easily quantifiable rate of return.
- The CNTL's efforts to disseminate information through written documents have been weak, particularly with regard to policy issues. According to the CNTL's director, resource constraints and productivity pressures are to blame: *"Information dissemination in written form is weak because of the need to be highly productive in order to survive with a small staff. UNIDO never funded the centre. External funding is needed to do the information dissemination work."* (Mr. Springer, CNTL)
- The potential for the CNTL to influence policymaking may be limited by a perception in government that the CNTL lacks experience and expertise in the policy arena. One government official questioned how the CNTL could devote sufficient time and capacity to engage effectively in policy-related activities: *"If, let's say, 60% of CNTL's time is spent doing consultancy, how would it be possible to influence policy? CNTL staff does not have the expertise to negotiate policy projects well."*
- Some stakeholders have pointed out the limited political autonomy of the CNTL. The centre is viewed as an arm of the host institution. This might influence the relationship between the CNTL and government officials because the Centre's position and opinions might be mistaken as those of industry.

2.1.4. The CNTL's Policy Performance

In the past, the CNTL has reached out effectively to national and state legislators to promote the integration of CP into public policy. Because of a change in CNTL management, however, there has been a lowering of the priority for policy work within the organization during the last year. A high-level commitment from the Ministry of the Environment has been difficult to obtain. Lack of interest in CP issues, geographic limitations (the centre's distance from the national capital), and other reasons identified above may help to explain the Ministry of the Environment's poor response to the CNTL's requests. However, CNTL has been able to get support for specific projects through the Ministry of Science and Technology, with which the CNTL has established a good relationship. Moreover, government institutions are participating in a multi-stakeholder initiative coordinated by CEBDS to implement local CP centres throughout the country. At present there are 7 CP centres and CNTL is responsible for providing CP capacity building training to those centres. A third strategy, being a resource for the MERCOSUR region on CP, is an ongoing process, and CNTL was able to get a

commitment from the participating countries to increase the use of CP concepts and measures. The terms of the agreement are still under discussion.

2.2. Czech Cleaner Production Centre

The Czech Cleaner Production Centre (CCPC) was launched in March 1995 in Prague, the capital of the Czech Republic. The CCPC currently is an independent, not-for-profit centre with no host institution. At the time of the site visit (February 4-8, 2002), the CCPC had a staff of eight people.

The CCPC has a subsidiary office in Karlovy Vary. It used to have an office in Brno, which was recently made financially independent from CCPC.

2.2.1. Policy Advice, Analysis, and Advocacy

The CCPC has pursued two main strategies to promote CP in public policy: lobbying the Ministry of the Environment to endorse the UNEP's 'International Declaration on Cleaner Production,' and developing a national policy framework under which CP could be introduced into a full range of governmental policies (i.e., beyond simply environmental policy). The following examples illustrate the CCPC's activities in these two areas:

- In 1999, the CCPC successfully lobbied the Ministry of the Environment to sign the UNEP's International Declaration on Cleaner Production. The Declaration was signed on the occasion of the 4th Annual Meeting of the UNIDO/UNEP NCPC Directors in Prague.
- Following the signing of the Declaration, the CCPC worked under the Ministry of the Environment to formulate a National Cleaner Production Programme (NCPP), with inputs from other Ministries. The NCPP was approved by a government decree in the beginning of 2000.
- Through the influence of the CCPC and other stakeholders, the 'National Development Plan for the Czech Republic for 2000-2006' embraces the preventive approach as the primary approach to improve the quality of the environment.

Another key policy focus for the CCPC has been the area of government support for CP projects in industry. The CCPC was instrumental in creating a governmental credit line to fund CP projects through the State Environmental Fund (SEF). The CCPC worked closely with the Ministry of the Environment to develop criteria for government funding for CP projects within the framework of 'best available technology' implementation.

2.2.2 Supporting Activities

The CCPC has sought to influence policymaking more subtly through other types of projects (e.g., information dissemination, demonstration projects, and data collection and analysis). While these activities may have a limited effect on policy in the short term, they are intended to help lay the foundation for future high-profile policy work. Furthermore, they are consistent with the overall objectives of the NCPP.¹⁰

- *Information dissemination.* Since its establishment, the centre has worked to raise awareness in all levels of government about CP. The CCPC has designed and delivered CP awareness raising modules to train public employees. It has also produced publications for government officials on topics such as “Introducing CP and Developing Municipal Policy” and “CP as part of EMS and Audit Scheme.” In 2000, in collaboration with the ‘Healthy Cities’ initiative of the World Health Organization,¹¹ the CCPC also launched a nationwide CP awareness raising campaign targeted at municipalities. The CCPC presented seminars on successful CP pilot projects to local politicians in 12 ‘Healthy Cities’ municipalities. As a result, the local councils of at least two ‘Healthy Cities’ municipalities¹² passed CP Programmes. The ‘Healthy Cities’ network and the CCPC have also worked together in organizing high-level national political events to highlight the results from the municipal CP Programmes and the signing on of those cities to UNEP’s International Declaration on Cleaner Production. These events were important marketing strategy promotions of the CP Programmes within local authorities, because both UNEP and the Ministry of the Environment were present.
- *Demonstration projects.* The CCPC has sought to influence public policy through CP demonstration projects as well. At the municipal level, the centre has worked with various stakeholders (industry, local government, NGOs) on CP demonstration projects. By 1999, the CCPC had helped develop six successful CP projects in industry, agriculture, and the service sector. The projects acted as instruments for the introduction and implementation of regional development plans and programs based on the principle of sustainable development.¹³
- *Data collection and analysis.* According to the former director of the CCPC, Mr. Vladimir Dobes, the centre’s hard data on the cost savings that have resulted from CP adoption in the Czech Republic were a key factor in convincing the government of the importance of supporting CP. The CCPC has maintained a good database of the overall impact of 50 CP projects in Czech industry. Extrapolating from the data it has collected, the CCPC has estimated that the

¹⁰ “One of the objectives of the Programme is to provide assistance in changing the attitude of relevant establishments, municipalities, state administration and the public concerning the choice of measures providing environment protection related to industrial and other activities, including providing relevant services, to persuade the above-mentioned institutions to consider their intentions in view of preventive measures and to give priority to those measures.” A. Christianova. “Cleaner production as an approach towards environmental protection and sustainable development.” *Priloha Zpravodaje MZP* 5/2002.

¹¹ This WHO initiative has the objective of improving the environmental and health conditions in towns and cities. The CCPC is a member of the ‘Healthy Cities’ network.

¹² <http://nszm.internet.cz/cb21/asp/egate.asp?id=1022> (web site of the Healthy Cities of the Czech Republic league)

¹³ *National Cleaner Production Program (NCPP) Handbook*. Prague: Ministry of Environment of the Czech Republic, April 2000.

Czech Republic would potentially save 50 billion CZK (US\$ 1,600,000,000) if all major industrial sectors were to adopt CP. The centre further calculated that industry could reduce its annual production of waste and pollution by 5-15% through better operation and maintenance (O&M) procedures and modest cost investments.

2.2.3. Opportunities for and Barriers to Promoting CP

This section describes some of the additional opportunities and barriers facing the CCPC as it works to promote CP at the national, regional, and local levels.

- The accession process that the Czech Republic is undergoing in order to become a member of the European Union (EU) has provided a prime opportunity for the CCPC to push for CP integration into national policies. The EU's adoption of more stringent environmental laws and regulations, especially the Integrated Pollution Prevention and Control (IPPC) Directive, which calls for use of the best available technology (BAT) within certain industry sectors, has created a demand within the Czech Republic for expertise in preventive measures. Because of the CCPC's connection with an international CP network (i.e., the NCPC Programme), the Ministry of the Environment designated the CCPC to be the body within the NCPP Programme to be responsible for ensuring the transfer of knowledge from the international level to a national context. The CCPC has capitalized on the opportunity to provide the Ministry of the Environment with research studies on issues such as: statistical monitoring of BAT indicators, techniques for mapping raw material and energy flows in companies and regions, and cleaner technology options for the Czech textile industry.
- The CCPC is the implementing agency for the Czech-funded CP-oriented technical cooperation projects abroad. The CCPC work in Armenia, Croatia, Russia, and Uzbekistan has transformed the centre into an expert resource for the region. This seems to be an indication that not only is the CCPC recognized as the expert resource, but that the government is sufficiently enthusiastic about CP to support the dissemination of CP to other countries with the relatively meagre funds it has available.
- The NCPP establishes a financial mechanism to support CP projects under the State Environmental Fund. The Ministry of the Environment has designated the CCPC to be the implementing agency for this programme. In theory, this provides the centre with a good opportunity to help shape government support for CP through individual grants. In reality, however, the programme is not necessarily supporting CP: in 2001 the SEF funding mechanism was transformed from a 'Cleaner Production Programme' into the BAT Programme, which subsidizes projects that lower environmental impact through BAT. In evaluating projects for funding, the programme no longer has to take CP into consideration as a selection criterion.
- The CCPC perceives a resistance toward CP inside Ministries other than the Ministry of the Environment. According to the centre's director, Anna

Christianova, *“The Ministry of Industry is interested in products, not production, that have to be competitive in the market.”* This comment reflects the view that the Ministry’s approach is a barrier to the promotion of CP. It is possible, however, to interpret the Ministry’s interest in products as an expression of support for CP principles, because a focus on products is a natural extension of a focus on production process (see § 4.1.2). This presents an opportunity for the Centre to show the interdependency between sustainable production and consumption and possibly use that to bring the two Ministries (Industry and Environment) to closer agreement on the benefits of CP.

- In some cases, attitudes within municipal government pose a barrier to the integration of CP into policies at the local level. While the ‘Healthy Cities’ network is trying to get more of its member municipalities involved with CP, local governments’ access to information about CP is still very limited. As a result, many local councils either feel that CP is an issue for industry and outside their municipalities’ purview, or that there is no need for their municipalities to go beyond what the national government is already doing in terms of promoting CP.
- According to a CCPC staff member, the pressure to be financially self-sufficient makes the centre work exclusively on project-based activities. Thus, the centre has to work on topics that are of interest to its funders, which may not necessarily encompass CP policy issues.

2.2.4. CCPC policy performance

The CCPC scored a major accomplishment with the creation of an important vehicle – the National Cleaner Production Programme - to promote CP. Unfortunately, the Programme in many ways appears to be an empty shell. According to an independent observer, the failure of the Ministry of the Environment to designate extra funds or personnel to implement the Programme makes further development virtually impossible. Consequently, there is a lack of enforcement of existing preventive programmes, laws and regulations in the country. The effective implementation of the NCPP will be CCPC’s major challenge in the near future.

The CCPC has had mixed success in implementing the NCPP to date. With funding from the Ministry of the Environment, the centre has moved forward on parts of a proposal to incorporate CP into a variety of Ministries. Specifically, the CCPC has commenced CP training for the staff of the Ministry for Regional Development and provided CP awareness raising training to the Ministry of Defence. However, it has stalled in its proposed efforts to work with the Ministry of Industry and Trade and the Ministry of Transport and Communication. Moreover, the centre has not yet succeeded in initiating NCPP discussions with the Ministry of Education, Youth and Sport. Clearly, untapped opportunities remain for the CCPC to promote the integration of CP into public policy.

As noted above, the CCPC provides expert judgment to the government regarding potential investment proposals under the SEF. The CCPC should leverage its role in this process to redirect the available funds toward CP implementation. Furthermore, the

CCPC should assist the government in making government funding for CP projects more accessible¹⁴ and more attractive¹⁵ to increase industry's interest in the program. By the end of 2001, the SEF had only received 3 CP proposals from industry.

2.3. Slovak Cleaner Production Centre

The Slovak Cleaner Production Centre (SCPC), established in 1995, is an independent, not for profit organization with no host institution. The SCPC is located in Bratislava, the capital of the Slovak Republic.

At the time of the site visit (February 12-14, 2002), the SCPC office employed a director, a deputy director, and four project managers. It also has an office manager, several part-time workers, and two volunteers doing their civil service instead of military service. Accounting and some special work are done on contract basis.

2.3.1. Policy Advice, Analysis, and Advocacy

The SCPC has only started working in the policy field quite recently. As a consequence, its main strategy has been to serve as a CP resource to the Ministry of the Environment. By formal written agreement with the Ministry of the Environment, the SCPC serves as a technical expert in five areas: 1) design of preventive strategies for environmental protection; 2) implementation of quality management systems (QMS), environmental management systems (EMS), occupational health and safety (OHS) management systems, environmental management accounting (EMA), and CP; 3) preparation of environmental reports; 4) prevention and reduction of environmental accidents and management of hazardous chemicals; and 5) verification and identification of appropriate projects for applying the Kyoto Protocol. The SCPC has suggested to the Ministry of the Environment that there be an international meeting for top level ministerial personnel in 2003, to provide information and training on EMA.

The SCPC has also prepared policy papers on specific topics for the Ministry's benefit. In 2000, in partnership with the Ministry of the Environment and the United Nations Division for Sustainable Development, the SCPC organized a regional expert meeting to discuss a methodology for developing national strategies for transferring CP technologies. A report entitled "National Strategies for Cleaner Technologies in Central and Eastern Europe and NIS" was prepared as a result of this project.

¹⁴ There are more than 50 programmes within the Ministry of the Environment to finance environmental proposals from different stakeholders (municipalities, industries, NGOs, etc). The State Environmental Fund (SEF) of the Czech Republic supports those programmes either by giving subsidies or low interest rate loans. The plethora of funding options can be confusing for industrial applicants.

¹⁵ In theory, the State Environmental Fund provides low interest rate loans to companies to adopt best available technologies, but in practice companies still have to obtain 20 percent of the loan from a commercial bank because SEF only finances up to 80 percent of the project. This presents a problem because local banks are not interested in financing CP projects due to the fear that new technologies are more likely to fail.

The SCPC has focused some of its efforts on integrating CP into policy at the local level. The centre has worked with municipalities in regional projects (“Enviro city 21” and “Enviro region 21”) aiming to develop a scheme that improves the environmental, social, economic and cultural aspects of municipalities. An example of municipal work is a project developed with the municipality of Martin. The three main components of this effort were: 1) workshops for the main local industrial polluters; 2) implementation of CP in the City Hall; and 3) workshops for public institutions and organizations.

2.3.2 Supporting Activities

Some of the SCPC’s other activities support its efforts to influence policymaking. These include information dissemination and demonstration projects.

- The SCPC has been very active in the media, publishing several CP articles in newspapers, promoting press conferences, etc. For example, there were 27 newspaper articles published in 1999 and 20 more in 2000. The centre also distributes a newsletter 3-4 times a year to its members, partners, several Ministries, and academia. It is anticipated that this efforts to disseminate information will help the SCPC influence policymaking by raising awareness raising and enhancing the centre’s credibility.
- An important effort of the SCPC has been to raise the CP awareness of policy makers and financial institutions through CP projects. The SCPC has participated in international projects such as UNIDO’s Transfer of Environmentally Sound Technology (TEST) and UNEP’s energy efficiency project.

2.3.3. Opportunities for and Barriers to Promoting CP

This section describes some of the additional opportunities and barriers facing the SCPC in its efforts to promote CP.

- According to a government official, the following programmes under the Ministry of Economy support CP: 1) a technology transfer programme that provides grants for SMEs to get access to clean technology; 2) implementation of quality management systems and environmental management systems (ISO 14000) in SMEs; 3) a program for eliminating all ozone depleting substances; and 4) an alternative energy source support programme. However, it seems that none of those programmes mention cleaner production as such. For instance, the technology transfer programme is a general programme for the transfer of technology that does not emphasize the use of clean technology, which would thereby promote cleaner production. Therefore, it is unclear to what extent these programmes actually promote CP on a large scale.

- Several other initiatives were mentioned by government officials as being supportive of CP, but it was impossible to assess whether they really embrace CP principles. Those actions were: 1) the creation of a sustainable development council; 2) a competitiveness assessment of the Slovak industrial sectors where environmental and sustainable development principles have been implemented; 3) a law on industrial parks; and 4) a law on investment incentives.
- The Slovak Republic is pursuing the EU accession process to become a member state of the EU. Stakeholders interviewed by the LCSP provided conflicting opinions as to whether the EU accession process is providing an opportunity for or a barrier to the integration of CP into public policy. Several stakeholders expressed the view that the accession process, and in particular the IPPC Directive, has created a demand for expertise in preventive measures (see discussion in §2.2.3 above). According to this view, the SCPC seized the opportunity to respond to that demand by providing studies to the Ministry of the Environment on relevant issues. For example, in its report, ‘IPPC-how will companies be able to comply?’, the SCPC conducted an evaluation of 300 companies to gauge industry’s perception of the upcoming law on IPPC, its knowledge about the Directive, its needs, and its plans for compliance with the law. Other stakeholders, however, offered a contrary assessment of the effect of EU accession on Slovak policy. One government official asserted that the initiative to enter the EU is a potential barrier to CP because it is forcing the country to create laws and regulations quickly, thereby compromising the quality of what is being written: *“EU legislation is basically end-of-pipe and our criticism is that they are adopting it because of time pressure and there is no time to design the way you want to.”*
- The director of the SCPC noted that it can be difficult to work with government officials when there are serious concerns about their capacities: *“The management of personnel resources at ministries is very poor, so those people very often don’t have basic information, basic training in the area where they operate. We feel the need to train those people, but because it’s not done in any systematic way, nobody cares about providing proper training to Ministry.”* Although it may be a short-term barrier to the SCPC’s policy work, the lack of information and training within Ministries also presents the centre with a good opportunity to raise the awareness of government officials at multiple levels.

2.3.4. SCPC policy performance

The SCPC has achieved its goal of being recognized by the Ministry of the Environment as an institution with CP expertise. Overall, the SCPC has established a productive relationship with the Ministry of the Environment. Nevertheless, CP has not yet been successfully incorporated into any high-level national policies. Moreover, it is unclear whether the centre’s relationship with the Ministry of the Environment will also open the doors to other Ministries in order to increase the centre’s ability to influence policies outside the environmental arena.

Several of the SCPC's regional initiatives appear to have developed local government support and expertise for sustainable development through CP. However, it is difficult to assess the impact of the centre's efforts on CP implementation because the centre has not been monitoring the implementation of CP-related projects. Due to a lack of data, the SCPC is currently unable to assess the environmental and economic benefits gained through CP implementation. As the CCPC's experience has shown, such information can play an important role in influencing support for CP in public policy.

2.4. Hungarian Cleaner Production Centre (HCPC)

The Hungarian Cleaner Production Centre (HCPC) was established in 1997 in Budapest, the capital of Hungary. The Department of Environmental Economics and Technology at the Budapest University of Economic Sciences and Public Administration is the host institution for the centre. Five staff members were working for the HCPC at the time of the site visit (February 25-March 1, 2002).

The HCPC launched four cleaner production regional centres in Győr, Debrecen, Veszprém, and Szeged, from 1998 to 2000.

2.4.1. Policy Advice, Analysis, and Advocacy

The HCPC's principle policy strategy has been to prepare position papers on policy topics for the government. Table 1 below provides examples of the types of policy research papers prepared by the HCPC between 1998 and 2001.

Title	Year of preparation
Hungary's Green Path to the EU Summary and Progress Report – 1997	1998
The Indirect Costs and Benefits of Greenhouse Gas Limitation: Hungary Case Study	1998
The Mitigation of CO ₂ Emissions in Hungary and the Accession to the EU	1998

Evaluation Of Environmental Management Practices of Hungarian Companies	1999
Elaboration of a macroeconomic index incorporating environmental changes – the calculation of the Genuine Progress Index for Hungary	1999
Integration of Cleaner Production Principles and Environmental Management Systems in Small and Medium Sized companies	1999
Integration of Cleaner Production Principles and Environmental Management systems in Small and medium Sized Companies	2000
Cleaner Production Policy Best Practice Manual	2001
The Analysis of Proposed Hungarian Regulation for Council Directive 96/61/EC on Integrated Pollution Prevention Control	2001
The Analysis of Social and Economic Impacts of the Introduction of the European Union's EMAS Directive in Hungary	2001

Source: HCPC web site at http://hcpc.bke.hu/exp_eng/04_indulo.htm

The HCPC has prepared at least four papers for the Ministry on CP issues. In 1999 and 2000, the centre issued two papers on the topic of the Integration of Cleaner Production Principles and Environmental Management Systems in SMEs. In 2001, it prepared a Cleaner Production Policy Best Practice Manual that developed criteria for identifying CP projects to be funded by the Ministry's specific credit line for CP. Also in 2001, the HCPC prepared an Analysis of Proposed Hungarian Regulation for Council Directive 96/61/EC on Integrated Pollution Prevention Control (the EU IPPC Directive). This paper assessed Hungarian industry's knowledge and perception of the Directive, ways to implement the Directive, and the cost of implementation. Hungary passed the IPPC Directive into law in October 2001.

The HCPC has also been active in promoting government funding of CP projects. The centre's staff believed that the criteria for government funding of CP projects were too strict, making it difficult for companies to get a loans. Consequently, the HCPC successfully lobbied for the Ministry of the Environment to sign UNEP's International Declaration on Cleaner Production. As a result, a financial scheme to fund CP was launched via the Central Environmental Fund, a financial institution under the Ministry of the Environment. The Central Environmental Fund's chapter on 'environmentally-friendly products, processes and technology' clearly allows for the funding of CP projects. The HCPC is currently working with the Ministry to fully adopt the criteria that the centre developed to evaluate project proposals.

2.4.2 Supporting Activities

The HCPC has undertaken other initiatives that support its efforts to influence policymaking.

- The HCPC's participation in international projects such as UNEP's energy efficiency project (just launched) and UNIDO's TEST project has allowed the

centre to develop new case studies based on pilot projects involving the practical application of CP in Hungarian industry. It has also provided a means to increase the centre's visibility and reputation as a technical provider of preventive measures to industry. It is expected that this visibility will help the centre in its efforts to influence policymaking.

- The centre has similarly sought to enhance its credibility with both industry and government policy makers through CP demonstration projects.
- The HCPC organizes and participates in training sessions, mini-conferences and presentations throughout the country to increase the awareness of government, industry, and the general public about CP concepts and tools.
- One major strategy undertaken by the HCPC to promote CP in the long run is to teach CP and other preventive concepts and tools in academic settings to future policy makers, among others. The HCPC has incorporated CP and other related issues into the environmental economics curriculum at the Budapest University of Economic Sciences and Public Administration (BUESPA) – the HCPC's host institution. According to the HCPC's 'Report of Activities from 1998-2000,' *"[a]bout 80% of the yearly enrolled 700-800 regular students of BUESPA study environmental economics for at least one semester at the university. Together with about 150 part-time students each year also studying related topics, this makes about 750 graduate economists per year having received a basic education on preventive environmental approaches."* Furthermore, the four regional cleaner production sub-centres are also located at universities, and they have all incorporated CP into their curricula as well.

2.4.3. Opportunities for and Barriers to Promoting CP

This section describes some of the additional opportunities and barriers facing the HCPC in its efforts to promote CP at the national, regional and local levels.

- In 1995, Hungary joined the Organization for Economic Cooperation and Development (OECD), and in the opinion of one local authority, *"OECD has a very strong pollution prevention policy, better than the EU policy, establishing several Programmes like greening the government."* Therefore, being a member of the OECD provides an opportunity for promoting the adoption of CP measures.
- The EU accession process is accelerating the adoption of new legislation, especially the IPPC Directive, which is forcing companies to adopt preventive measures in a very short period of time.
- BUESPA has a good reputation in the field of environmental management. HCPC staff members have affirmed that the centre's affiliation with a host institution possessing credibility in the policy field has made it easier for them to provide policy advice to government.

- According to a government official, *“The barrier for implementing the IPPC Directive is on financing environmental investments. Government cannot subsidize projects through the State budget because it goes against the EU law on free competition.”*

2.4.4. HCPC policy performance

The HCPC has a well-developed relationship with the Ministry of the Environment. This relationship has enabled the centre to provide policy advice to the Ministry through various research papers and to help shape the creation of a specific budget line for CP under the Ministry’s Central Environmental Fund. The HCPC is currently planning to develop a national policy framework through which CP may be introduced into the full range of government policies, beyond just the environment.

2.5. Mexican Cleaner Production Centre (CMP+L)

The Mexican Cleaner Production Centre (CMP+L) was launched in December 1995 in Mexico City, the capital of Mexico. The National Polytechnic Institute is the host institution for the centre. At the time of the visit, the CPM+L had the largest number of employees (21)¹⁶ of the five centres studied.

At the time of the site visit (April 8-12, 2002), the CMP+L was finalizing a proposal to the Inter-American Development Bank (IDB) to create three regional CP centres to cover the North, Central and Southern areas of the country. Funding would come from the IDB, the United States Agency for International Development (USAID), state government, local industry, and the CMP+L. The new centres would follow more or less the same model as the CMP+L except that to satisfy the IDB’s funding requirements, they would be hosted by industry instead of an academic institution like the CMP+L.

2.5.1. Policy Advice, Analysis, and Advocacy

The CMP+L stands out from the other four centres visited in that its strategy has been to influence policymaking through a CP stakeholder network. Through a multi-phased approach, the CMP+L and others identified key stakeholders, interviewed them to identify their positions on activities regarding CP, and promoted a 1 1/2 day awareness-raising workshop on CP. As a result of this process, a working group was formed with representatives from the national and city governments, Congress, industrial organizations, universities, and banks.

One of the main accomplishments of this working group has been to help form the Mexican Pollution Prevention Roundtable, which the CMP+L coordinates. The

¹⁶ CMP+L web site at <http://www.cmpl.ipn.mx>

Roundtable's policy working group has sought to analyse the opportunities and barriers to promote CP within the existing Mexican regulatory framework. It is currently formulating a proposal for a National Policy on Prevention that would incorporate CP into the National Environmental Programme. In addition, the working group has recommended that the government provide incentives for CP adoption, such as an exemption from environmental audits whenever a company presents a CP plan, and explore the possibility of voluntary agreements with some industrial sectors to adopt CP.

2.5.2 Supporting Activities

The CMP+L has undertaken a variety of activities that support its efforts to influence policymaking:

- Since the establishment of the centre, the CMP+L has been promoting general awareness-raising about CP to multiple stakeholders in the country and abroad. The centre has also conducted CP demonstration projects to show the feasibility and advantages of adopting this concept within industry. It is expected that this level of visibility will help the CMP+L in its policy efforts. Indeed, the CMP+L draws upon its experience with CP demonstration projects to promote the inclusion of the CP concept into Mexican laws and regulations.
- The Mexican Pollution Prevention Roundtable's working group on CP and education is seeking to assess academic programmes to verify where prevention is being taught. The working group's goal is to reach future policy makers by incorporating CP into the academic curricula of engineering and management schools.
- Successful demonstration projects undertaken by the CMP+L in one Mexican State (Queretaro) catalyzed the State government's involvement in CP promotion. Queretaro State now actively participates in the Mexican Pollution Prevention Roundtable, and in 2001 it used some resources to work with local industries and universities in capacity-building courses.
- The CMP+L is the regional coordinator for the CP centres in the Central American region (Costa Rica, El Salvador, Guatemala, and Nicaragua), which includes the Central American NCPCs plus other bilateral CP centres in Latin America. The CMP+L assisted UNIDO in organizing two policy-oriented regional meetings to bring together government officials from the four Central American countries.

2.5.3 Opportunities for and Barriers to Promoting CP

This section describes some of the additional opportunities and barriers facing the CMP+L in its efforts to promote CP at the national, regional and local levels.

- Although they reflect diverse interests, the stakeholders in the Mexican Pollution Prevention Roundtable have offered a consistent set of policy recommendations. All stakeholders interviewed identified the same set of fiscal and economic incentives to promote CP (e.g., reducing the import tax on cleaner allowing accelerated depreciation of clean technology equipment). This consistency of message has the potential to reinforce the CMP+L's efforts to influence policymaking.
- Several federal programmes (including the Mexican Environmental Programme for 1995-2000, the Minimization and Integrated Management of Industrial Hazardous Waste Programme for 1996-2000, and the Strategic Initiative of the Mexican Industrial Sector, Competitiveness, and Environmental Protection) have explicitly recognized the CMP+L's role in CP promotion and technology diffusion. However, none of these Programmes have resulted in concrete support for the centre (financially or otherwise). It is possible that the lack of results might have a chilling effect on the CMP+L's future efforts to incorporate CP into policy at the federal level.
- The CMP+L works with municipal governments to help facilities adopt CP technologies. The centre has an existing partnership with at least one forward-thinking municipal government (Naucalpan) that is beginning to push CP through its enforcement actions. A Naucalpan government official reports that his office has started requiring each facility that has violated environmental regulations to submit to an evaluation by an expert institution qualified to develop a plan for reducing its environmental impact. The facility must then present the government with a CP plan that includes a detailed schedule of the measures to be done. Furthermore, it must provide progress reports until it completes the CP plan implementation. In addition, the Naucalpan government has begun imposing larger environmental fines, which has provided companies with new incentives to modify their operations rather than just pay a small penalty. This situation provides the CMP+L with an opportunity to assist the Naucalpan government with further CP-oriented policy development.
- According to one government official, fiscal and economic incentives to promote CP, even if they exist on paper, are difficult to implement due to the economic situation of the country. In other words, the government is not willing to give up revenue by offering these incentives.
- Stakeholders have pointed to the current National Environmental Audit Programme as a barrier to CP. This is a voluntary environmental policy tool to audit industry focusing on reducing and correcting emissions to the environment. However, it does not explicitly mention source prevention.

2.5.4. The CMP+L's policy performance

Several national policies have been influenced by the work of the CMP+L and of the Mexican Pollution Prevention Roundtable, which is coordinated by the CMP+L. These include: the Mexican National Development Plan for 1995-2000, which identified the promotion of CP as one of its specific objectives; and the Mexican National Development Plan for 2001-2005, which contemplates preventive measures. In addition, the Mexican Environmental Programme for 1995-2000 has made support of the CMP+L (financial and otherwise) one of its priorities. These plans and programmes are a clear indication of the success of the Centre's work.

Chapter Three: Comparative Analysis of the Five NCPCs

All of the five NCPCs visited showed evidence that they have been working on public policy issues in their countries. As Table 2 illustrates, all five countries have engaged in CP-related policymaking to some degree, albeit with varying levels of sophistication. However, it is difficult to establish a causal connection between the NCPCs' efforts and any CP policies that may have been adopted in their host countries. Given the gradual nature of policymaking, it may yet be too early to assess the impact of the NCPCs' activities on policymaking in their host countries.

Table 2: Comparison of the Five Mature NCPCs					
	Brazil	Czech Republic	Slovak Republic	Hungary	Mexico
Host institution	Industrial association	Independent	Independent	Academia	Academia
Link to government policy bodies	Informal relations with multiple agencies	Written agreement with Ministry of Environment	Written agreement with Ministry of Environment	Informal relations with multiple agencies	Mexican Pollution Prevention Roundtable
Main strategy for developing CP policy	Works with existing government working groups (national and regional) to incorporate CP into their policies.	Approval of National CP Programme (NCPP) by Ministry of Environment. The NCPP creates a framework to work with all other Ministries to incorporate CP into the full range of government policies.	Writes policy position papers mostly at the request of Ministry of Environment.	Publications and policy position papers for government and also writes papers on topics that the Center initiates.	Established a stakeholders working group (roundtable) to incorporate CP into specific national and regional policies.
Notable CP policy successes	The centre is working with the State of Rio Grande do Sul to negotiate a program that would offer financial aid to industry that wants to adopt clean technology	Helped get the National Cleaner Production Programme passed; will enable harmonization of policies	Several of the SCPC's regional initiatives appear to have developed local government support and expertise for sustainable development through CP	The creation of the Central Environmental Fund's chapter on 'environmentally-friendly products, processes and technology', clearly citing CP projects as fundable	Launched and coordinated the multistakeholder Mexican Pollution Prevention Roundtable
Government Programmes to implement CP policies	Limited (e.g. inputs on national hazardous waste Programme)	Well developed national framework (NCPP).	Limited (e.g. IPPC Directive, inputs on national hazardous waste law)	Limited (e.g. IPPC Directive)	Limited (e.g. inputs on national environmental Programme)
Government Programmes to finance technical CP projects	Limited (e.g. R&D funding)	Limited (e.g. government credit line for BAT)	Non-existent	Limited (e.g. government credit line for CP projects)	Limited (e.g. FIPREV credit line for pollution prevention)

3.1. The NCPCs' policy-related activities and achievements

The NCPCs have differed to some extent in their main strategies to promoting CP in policymaking. The three Central European NCPCs have devoted resources to providing their Ministries of the Environment with policy papers and to lobbying their governments to sign the UNEP's International Declaration on Cleaner Production. The Latin American centres have placed greater emphasis on building networks and workgroups to promote CP. At the same time, they have also pushed for specific legislative changes that would facilitate the diffusion of CP.

Notwithstanding these differences, the NCPCs have engaged in many of the same types of activities to promote the integration of CP into public policy. All of the NCPCs have: provided CP awareness-raising programmes to government officials where possible; drawn government officials into their stakeholder networks; and engaged in dialogue with government officials to provide greater fiscal and economic incentives for CP.

3.2. Influence of the NCPCs' activities on public policies

It is difficult to measure the extent to which specific policies, measures, or changes in laws and regulations may be attributed directly to the NCPCs' work. Policy initiatives do not often give rise to concrete measurable outputs. Even if they do, the time lapse between policy implementation and result is usually so long that a causal relationship is obscured.

Little work has been done to follow up on the centres' policy work and monitor the tangible results (if any) that it produced. At the same time, there is evidence that the work undertaken by the NCPCs has had some direct influence on public policy:

- The Mexican National Development Plan for 1995-2000 clearly mentioned promoting CP as one of its specific objectives for this period, and the Mexican Environmental Programme 1995-2000 set as one of its priorities the provision of support (financial and other) to the CMP+L. These objectives and priorities indicate the Mexican government's recognition of and commitment to the importance of CP and the CMP+L's work.
- According to a Hungarian university professor, the HCPC's policy work has had two visible impacts over the past few years: the term "CP" has begun to appear in government policies, and the government has begun to make funding available to companies for CP projects.

3.3. Relationships with government policymakers

In order to have an influence on public policymaking, the NCPCs need to have some kind of interaction with public policymakers. In the absence of meaningful communication, any activities undertaken by the NCPCs with the goal of shaping public policy will be ineffective. Moreover, government adoption of CP-friendly policies

without input from the NCPCs would cast serious doubt on the relevance of the centres to the policy formulation process. Consequently, the centres' relationships with government policymakers at the national and state level warrants examination.

All of the NCPCs except the CNTL have a close relationship with their Ministry of the Environment (or, in the case of Mexico, with the Mexican EPA). Geographical considerations suggest a practical explanation for why CNTL has not established day-to-day contact with the Brazilian government: of the five centres visited, only CNTL is located outside of the national capital. The CNTL does have a good relationship with its state-level environmental agency.

Aside from the Ministries of the Environment, however, the NCPCs in general do not seem to have well-established working relationships with other ministries. The one exception is CNTL, which has a well-established relationship with a research and development agency inside the Ministry of Science and Technology, as well as some interaction with the Ministry of Foreign Affairs. This is not to say that the centres do not interact with other ministries. To the contrary, both HCPC and SCPC have representatives of other ministries on their steering committees/advisory boards. Similarly, CCPC and CMP+L work informally with other ministries through the Czech National Cleaner Production Program and the Mexican Pollution Prevention Roundtable, respectively.

Interestingly, with the exception of the CNTL, the NCPCs in general have not been in contact with their countries' legislators in parliament or congress. This may have hampered the centres' effectiveness in leveraging CP-oriented changes to existing laws and statutes.

3.4. Relationships with host institutions

Numerous stakeholders interviewed indicated that the host institutions of the NCPCs were important players in the policy arenas of their countries. Therefore, it is useful to examine the role that these institutions have played in helping the NCPCs promote CP policy.

Of the five NCPCs visited, two (CMP+L and HCPC) are hosted by universities and one (CNTL) is hosted by an industrial association. The remaining two centres (CCPC and SCPC) do not have host institutions but rather work as non-profit, independent civic associations. This section explores some of the advantages and disadvantages associated with each type of host institution arrangement.

Several stakeholders noted that a university association provides several types of advantages. First, policy advice is received more readily from a university-based institution because of the perception that it is a neutral organization. The staff of CMP+L affirmed that the association with the National Polytechnic Institute gives credibility to their work. Similarly, a Hungarian university professor observed that the HCPC's academic reputation has enhanced the impact of the papers and books that the centre has published. Second, the universities have provided the centres with facilities and supplies

(e.g., rooms, energy, copying services) as well as human resources (e.g., students to conduct research for policy papers). This assistance has freed up the centres from some of the pressure to meet expenses. Third, the university-based centres have had the opportunity to play a role in educating potential future policy makers and industry managers in preventive approaches.

The HCPC's association with the Department of Environmental Economics and Technology at the Budapest University of Economic Sciences and Public Administration has been particularly beneficial to its efforts to integrate CP into public policy. Because the Department had a history of working with environmental management issues, the centre did not have to build its reputation from scratch before doing policy work. Moreover, the centre did not have to struggle to get access to government policymakers because the Department had a tradition of providing policy advice to the government. With this entrée, the HCPC has been able to respond to the great need within government for policy advice due to the EU accession process. While the HCPC's relationship with its host institution might be unique compared to the other NCPCs in the region, it is an enviable model for providing a centre with access and opportunity to influence policy.

The experience of the CNTL as an NCPC hosted by an industry association (the National Service for Industrial Learning, or SENAI) has been mixed. Theoretically, a connection to an industry association should enhance the centre's credibility as part of a larger industry network. In practice, the CNTL has found that it is viewed by NGOs and other stakeholders as a representative of the industrial sector and not as an independent expert. (At the same time, CNTL staff assert that the close connection shows that they are not marginalized within the industrial sector.) Furthermore, according to one government official interviewed, SENAI's antiquated and unwieldy hierarchical structure curtails the CNTL's autonomy. According to another independent observer, the institutional arrangement is flawed because it lacks the involvement of the municipal government. The observer recommended a partnership among government, industry, and the centre to provide financial support for the centre's consultancy work, perhaps along the lines of the "Eco-Profit Programme" in the city of Graz, Austria. Closer ties to government would presumably also provide the centre with better access to policymakers, particularly at the federal level.

Despite the drawbacks associated with particular centre/host institution configurations, it appears that having a host institution helps rather than hinders work in the policy arena. The two centres (CCPC and SCPC) without a host institution have enjoyed total freedom and flexibility with regard to how they spend their time and resources. At the same time, they have had to build their credibility and reputation from scratch, open their own doors to government policymakers, and generate all of their income from project-based activities. Furthermore, although the centres have not had to follow a host institution's political agenda, they have been compelled at times to comply with the policies of a paying client and restrict the portion of the work that they are able to present publicly. According to the CCPC staff, the restraints imposed by clients are a major barrier to the centre presenting a viewpoint on CP in the public arena that is perceived to be independent.

Chapter Four: Recommendations

The previous chapter analyzed the main accomplishments (and shortcomings) of the five chosen NCPCs with regard to policy work. This chapter identifies potential ways for all of the NCPCs to overcome existing challenges and maximize their effectiveness as they work to influence government policy around CP. The chapter concludes with recommendations as to how UNIDO and UNEP can better support the NCPCs' policy work.

4.1. Recommendations for the NCPCs

4.1.1. Continuation of existing efforts

Based on the site visits to the five NCPCs and the interviews with other NCPC directors in Seoul, it is clear that the centres are currently engaged in a wide range of efforts to integrate CP into policies and laws. This section offers recommendations to help the NCPCs improve their chances of success in these endeavors.

- *Building a strong public policy network.* By their nature, the NCPCs cannot make public policy; they can only seek to influence those who do. All of the NCPCs have engaged in efforts to recruit other stakeholders to the cause of promoting CP integration into public policy, in order to increase their potential collective influence over the policymaking process. The NCPCs should reinforce existing linkages and build new ones because stronger networks increase the chance of representation in the policymaking process - and the likelihood of actual changes in policies. The NCPCs should establish new partnerships with environmental non-governmental organizations and public health institutions that can do advocacy work to promote CP. This will require outreach and education by the centres to help these groups understand the potential for CP to benefit the environment and human health. The NCPCs should also reach out to consumers' groups, which may be willing to push for the incorporation of CP into production processes if this will help make consumer products safer. There are active consumer groups in almost all of the countries in which the existing 23 NCPCs are located.¹⁷ The centres might want to explore alliances with industry trade associations or large multinational companies to push for the adoption of fiscal and economic incentives (e.g. fast depreciation of clean technologies and reduced taxes on importation of non-hazardous raw materials). The NCPCs should also step up their efforts to work with municipal/local governments, perhaps through municipal networks or trade associations. For example, many municipalities that participate in the 'Healthy Cities' network are now preparing their strategic

¹⁷ For listings by country, see the web site of Consumers International, the umbrella organization for consumer groups worldwide: <http://www.consumersinternational.org/directory/>.

development plans, and some are considering the inclusion of CP adoption and ISO 14000 certification as long-term strategies.

- *Cultivating relationships with diverse government officials.* The centres must continue to strengthen the relationships they have established with the national and regional environmental agencies of their countries. At the same time, they must also cultivate relationships with other Ministries (e.g., Science and Technology) to open up additional avenues for influencing the public policymaking process. Furthermore, it is important that the NCPCs establish direct links to their countries' legislators. Even with limited resources, the NCPCs can foster relationship-building at minimal cost by inviting government officials to sit on their advisory boards or speak at their events.
- *Capturing and maintaining government's interest in CP.* The centres need to continue to try to interest their governments in CP through network-building, education and outreach, and high-profile events involving foreign dignitaries (e.g., top-level United Nations officials).
- *Helping government to capture and maintain industry's interest in CP.* As the CNTL staff affirmed, companies think CP is an excellent thing after a CP project has been implemented, but it is difficult to interest them in the first place. The NCPCs need to help their governments find better ways to demonstrate the financial rewards that accompany the implementation of CP, perhaps through targeted case studies or workshops. In addition, the NCPCs must help their governments figure out a way to stress the other benefits of CP implementation, such as enhanced company image, enhanced ability to satisfy customer requirements (especially in foreign markets), enhanced ability to meet regulatory obligations, etc. Governments in other countries are experimenting with innovative ways to transfer knowledge and enthusiasm among firms (e.g., mentoring programs in which larger companies help smaller companies understand the benefits of CP and provide advice on topics from selection to implementation). The centres need to bring these new ideas to the attention of their governments.
- *Helping government make CP more financially attractive.* The NCPCs need to continue their efforts to help governments make CP more financially attractive to industry. One way for the centres to do this is to work with their governments to publicize existing but underutilized financing programs. Another option is for the centres to try to persuade their governments to influence their regional development banks (or, for the European NCPCs, the EBRD representative in their countries) to establish specific credit lines for CP.
- *Finding resources to support policy work.* The NCPCs are under pressure to sustain themselves financially. In the absence of funding to support policy work, they have found it difficult to lobby for laws and regulations that would promote CP. The centres should explore the possibility of securing funding from grant programs, philanthropic foundations, and donors with interest in public policy. In addition, the centres should tap the resources of public policy programs at their countries' universities. Graduate students may be interested in conducting policy research or drafting policy analyses to fulfill their academic requirements.

- *Leveraging international agreements to promote CP.* In some instances, the framework of international law has provided the NCPCs with unique opportunities to promote the integration of CP into policy. A prime example is the IPPC Directive, which requires large companies to adopt best available technologies. In interviews with the LCSP, stakeholders repeatedly identified this Directive as the single most important piece of legislation driving companies to implement CP projects in central Europe. The nature of the EU accession process has provided the impetus for governments to embrace CP: any country seeking to be part of the EU must adopt the IPPC Directive as national law, and governments are beginning to realize the impossibility of complying with this requirement without adopting preventive measures.¹⁸ In the case of this particular Directive, the central European NCPCs seized upon the opportunity to influence the policymaking process, by providing expert advice to their Ministries of the Environment to tailor the Directive to each country's needs. Other NCPCs should aggressively explore similar opportunities that may be provided by international laws or economic agreements (e.g., MERCOSUR for Brazil, NAFTA for Mexico).

4.1.2. Additional opportunities

This section identifies additional ways for the NCPCs to promote the integration of CP into policy. Some of these options represent new directions for the NCPCs, while others are simply extensions of the work that the centres are already undertaking.

- *Shifting governmental focus from production to products.* Process-oriented strategies can effectively reduce the environmental impacts associated with the design and manufacture of products. However, by their nature, they do not address the increasingly significant environmental impacts associated with the selection, use, and disposal of products by consumers. Over the last decade, changes in consumption patterns (e.g., population growth, an increasing standard of living, individual desires to consume products and services) have offset the environmental gains that have been achieved through programs aimed at making production processes cleaner and more efficient. This challenge requires the adoption of product-oriented strategies and a paradigm shift to a sustainable economy built around sustainable products, not just sustainable industrial processes.¹⁹ Policy work in this area is within the purview of the NCPCs' activities – indeed, UNEP already considers a focus on products to be an integral part of the NCPCs' mission.²⁰
- *Helping policymakers link production with consumption.* Consumption and production have traditionally been conceptualized as separate systems. This

¹⁸ Interview with Mr. Sandor Kerekes, director of the HCPC.

¹⁹ Lowell Center for Sustainable Production, "Sustainable Production & Consumption: Making the Connection," *Capacity Building in Cleaner Production Centres Training Package (Component 1)*, Paris: UNEP/UNIDO, 2002.

²⁰ Ibid.

distinction is reflected in the multitude of programs or initiatives that have been established in one area or the other (but rarely both). Yet neither consumption nor production operates as an isolated system. The consumption of products requires that products be produced, and the production of products requires that they be consumed. UNEP and UNIDO consider the integrated concept of sustainable production and consumption to be so important that they recently offered a customized training course to help the NCPCs better understand the consumption/production linkage and the significance to their work of such an approach.²¹ The NCPCs could recruit the assistance of UNEP and UNIDO to modify the training that they received so that it would be appropriate for delivery to government policymakers and other stakeholders (e.g., environmental and consumer NGOs) in their countries.

- *Stimulating demand for products manufactured using CP technology.* In market-based economies, consumer preferences have a significant influence on product design. In many countries, the government is the single largest consumer of goods and services: the U.S. federal government, for example, purchases more than \$250 billion worth of goods and services annually.²² Due to their tremendous purchasing power, governments have the opportunity to leverage their influence over products and services so as to minimize the environmental burdens associated with their production.²³ This, in turn, would create or expand the market for products manufactured using CP technology. The NCPCs should identify the offices in their national and regional governments that have oversight over purchasing decisions and work with them to “green” their purchasing procedures. The NCPCs could solicit assistance from UNEP, UNIDO, or the OECD, which has issued a set of recommendations on environmentally preferable purchasing in the public sector.²⁴
- *Boosting recognition of CP adopters.* The NCPCs are already helping businesses to improve the environmental attributes of their products and minimize the environmental impacts of their production activities. The NCPCs can provide another valuable service by helping manufacturers gain recognition for “green” products. The centres should encourage their governments to provide more incentives for CP through publicity and/or awards (e.g., the creation of a ‘CP seal’ for companies that adopt CP/PP measures). The NCPCs could also assist companies that adopt CP by helping their products qualify for existing recognition programs in other countries (e.g., Germany’s Blue Angel), which would open up new markets for their products.
- *Encouraging the incorporation of incentive-based programs into regulatory frameworks.* Enforcement of environmental laws is resource-intensive. Many

²¹ The two-day training on “Sustainable Production & Consumption: Making the Connection” was offered to the NCPCs in Berlin, Germany, September 23-24, 2002.

²² U.S. EPA, *State and Local Government Pioneers: How State and Local Governments are Implementing Environmentally Preferable Purchasing Practices*, <http://www.epa.gov/oppt/epp/pubs/statenlocal.pdf>.

²³ <http://www.epa.gov/oppt/epp/about/about.htm>

²⁴ <http://www.oecd.org/env/>

countries are complementing their enforcement strategies with collaborative approaches designed to elicit enhanced environmental performance from industry. For example, the National Performance Track Program in the United States is an “environmental leadership” program that offers companies regulatory and/or enforcement flexibility in exchange for going beyond their environmental requirements. These types of approaches have the potential to be more cost-effective and less politically sensitive than command-and-control strategies. The NCPCs should encourage their governments to explore mechanisms that will encourage companies to implement CP on a voluntary basis. In addition to recognition programs that reward companies for CP implementation (see above), incentive mechanisms could include policies that provide regulatory flexibility for enterprises that present a comprehensive CP plan including an EMS.

4.2. Recommendations for UNIDO and UNEP

In discussions with NCPC directors and with UNIDO and UNEP staff, the issue of what international agencies can do to support centres’ policy efforts has frequently arisen. This section offers some recommendations on how UNIDO and UNEP can better support the NCPCs’ policy work.

- *Clarify expectations and provide policy support.* Although public policy advice has been recognized by the NCPC Programme as an important core service, neither UNIDO nor UNEP has provided the NCPCs with substantial guidance or support on how to strategize a policy intervention that would effectively promote CP in their countries. UNIDO/ UNEP should provide more specific guidelines on what is expected from the NCPCs in terms of policy advice to government. This could involve building a template to help NCPCs determine how to do policy work. In addition, UNIDO /UNEP should develop a training and support program for NCPCs. To staff this program, UNIDO / UNEP should draw upon the resources of the NCPCs that have had success in developing policy strategies, as well as counterpart institutions with a history of providing policy support to NCPCs.
- *Develop an evaluation tool and indicators for policy work.* Perhaps because of the difficulty in evaluating results of policy initiatives, indicators of progress and measures of success for evaluating a centre’s policy performance were not built into the NCPC Programme. As Mrs. Feckova, director of the SCPC, pointed out: “Policy work is very problematic in terms of reporting the performance of the centre. You spend a lot of time and effort but there’s not much visible.” UNIDO/UNEP should develop a framework to assist each of the centres in developing its own set of indicators to use as a guide in its policy strategy development. It would not be appropriate for UNIDO/UNEP to try to come up with a boilerplate set of indicators, because each NCPC host country has its own individual needs and characteristics. It would, however, be appropriate for UNIDO/UNEP to develop a realistic evaluation tool as part of the overall centre evaluation process so that the centres can justify the resources they expended on

policy work and take credit for successes. UNIDO/UNEP could provide training to the NCPCs on the process of developing indicators at an Annual Directors' Meeting.

- *Develop incentives for NCPCs to do policy work.* The NCPCs' annual planning process does not provide incentives for NCPCs to do policy work. Currently, the NCPCs do not receive credit for doing work in the policy arena because such work does not count toward the successful execution of their workplans. Moreover, the rewards of successful policy strategies are often evident only in the long-term, i.e. well beyond a one-year framework. UNIDO/UNEP should consider offering shorter-term incentives to do policy work, such as monetary bonuses or additional human resources (e.g., policy interns). They should also build incentives into the centres' workplans that are connected to appropriate indicators of progress and measures of success (see above).
- *Assist in the expansion of NCPC programs within host countries.* UNIDO/UNEP should raise funds for follow-up programmes to expand the sphere of influence of well-established NCPCs. These programmes might assist in the establishment of local CPCs around the country to work with regional and local policymakers. Such centres would enlarge the NCPCs' stakeholder networks and expand their sphere of influence because of the relationships these centres would cultivate with local and regional policymakers.
- *Evaluate the policymaking potential of new NCPCs.* In reviewing potential NCPCs, UNIDO/UNEP should examine the proposed host institutions' relationships with policymakers at the national, regional, and local levels.
- *Collect information necessary to support CP policy.* The CCPC's strategy of collecting data to demonstrate the national benefits of CP implementation proved to be very effective. UNIDO/UNEP should support, financially or otherwise, the NCPCs' efforts to conduct economic studies of the national benefits of CP, by sector or geographical region. Data from these studies could document the potential economic, social and environmental benefits for a country if CP were to be adopted on a large scale. Studies could be done. A collation of such documentation from all the centres could be used by the NCPC Programme to build its case with donor countries to obtain additional funds.

Appendix A: Acronyms and Translations

ADB – Asian Development Bank

AGAPAN – Associação Gaúcha de Proteção ao Ambiente Natural (Environmental NGO – Brazil)

ASPEK – Asociácia priemyselnej ekológie na Slovensku (Slovak Industrial Ecology Association)

BAT – Best Available Technology

BNDES – Banco Nacional de Desenvolvimento Econômico Social (National Economic and Social Development Bank – Brazil)

BRDE – Banco Regional de Desenvolvimento do Extremo Sul (Regional Development Bank of the Extreme South – Brazil)

CANACINTRA – Cámara Nacional de la Industria de la Transformación (Mexican largest industrial association)

CCPC – Czech Cleaner Production Centre

CEBDS – Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável (Brazilian WBCSD)

CEC – North American Commission for Environmental Cooperation

CMP+L – Centro Mexicano para la Producción Más Limpia (Mexican Centre for Cleaner Production – the Mexican NCPC)

CNPq – Conselho Nacional de Desenvolvimento Científico e Tecnológico (National Council on Scientific and Technological Development – Brazil)

CNTL – Centro Nacional de Tecnologias Limpas (National Centre on Clean Technologies – the Brazilian NCPC)

CODEMA – Conselho de Meio Ambiente da FIERGS (FIERGS' Environmental Council – Brazil)

CONAMA – Conselho Nacional de Meio Ambiente (National Council on the Environment – Brazil)

CONCAMIN – Confederación de Cámaras Industriales de los Estados Unidos Mexicanos (Industrial Chamber Confederation for the United States of Mexico)

CONIECO – Consejo Nacional de Industriales Ecologistas (Mexican Environmental Industrial Association)

CP – Cleaner Production

EBRD – European Bank for Reconstruction and Development

EMA – Environmental Management Accounting

EMAS – Environmental Management and Audit System

EMS – Environmental Management System

ERCP – European Roundtable on Cleaner Production

EU – European Union

FAPERGS – Fundação de Amparo à Pesquisa do Estado do Rio Grande do Sul (R&D Financial Institution for the State of Rio Grande do Sul – Brazil)

FEPAM – Fundação Estadual de Proteção Ambiental (Department of Environmental Protection for the State of RS – Brazil)

FIERGS – Federação das Indústrias do Estado do Rio Grande do Sul (Industrial Federation for the State of RS – Brazil)

FINEP – Financiadora de Estudos e Projetos (National R&D Financial Institution under MCT – Brazil)

FIPREV – Fondo para Proyectos de Prevención de la Contaminación (Mexican funding Programme)

FUNTEC – Fundación Mexicana para la Innovación y Transferencia de Tecnología en la Pequeña y Mediana Empresa (Mexico)

GTZ – Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)

HCPC – Hungarian Cleaner Production Centre

IDB – Inter-American Development Bank

IPPC – Integrated Pollution Prevention and Control Act

ISO – International Standard Organization

ITESM – Instituto Tecnológico y Estudios Superiores de Monterrey (Mexican university)

ITPO – Investment and Technology Promotion Office (UNIDO)

KOVET – Környezettudatos Vállalatirányítási Egyesület (Hungarian Association for Environmentally Aware Management)

LCSP – Lowell Center for Sustainable Production

MCT – Ministério de Ciência e Tecnologia (Ministry of Science and Technology – Brazil)

MEA – Multilateral Environmental Agreement

MERCOSUR – Mercado Comum do Sul

MMA – Ministério do Meio Ambiente (Ministry of the Environment – Brazil)

NAFIN – Nacional Financeira (Mexican financial institution)

NCPC – National Cleaner Production Centre

NCPP – National Cleaner Production Programme of the Czech Republic

NGO – Non-Governmental Organization

OECD – Organization for Economic Cooperation and Development

OHS – Occupational Health and Safety

PREPARE – Preventive Environmental Protection Approaches in Europe

QMS – Quality Management System

REC – Regional Environmental Centre

RHAE – Programma de Capacitação de Recursos Humanos para Atividades Estratégicas (National scholarships for capacity building on strategic activities – Brazil)

RS – State of Rio Grande do Sul (Brazil)

RJ – State of Rio de Janeiro (Brazil)

SCPC – Slovak Cleaner Production Centre

SD – Sustainable Development

SEBRAE – Serviço Brasileiro de Apoio às Micro e Pequenas Empresas (Brazilian industrial association for SMEs)

SEF – State Environmental Fund of the Czech Republic

SEMA – Secretaria de Meio Ambiente do Estado do Rio Grande do Sul (State Environmental Secretary for RS – Brazil)

SEMARNAT – Secretaría de Medio Ambiente y Recursos Naturales (Mexican EPA)

SENAI – Serviço Nacional de Aprendizagem Industrial (National Service for Industrial Learning – Brazil)

SME – Small and Medium Enterprise

TEST – Transfer of Environmentally Sound Technology (UNIDO-GEF)

UFRGS – Universidade Federal do Rio Grande do Sul (Federal University of RS – Brazil)

UN – United Nations

UNAM – Universidad Nacional Autónoma de México

UNDESA – United Nations Department of Economic and Social Affairs

UNEP – United Nations Environment Programme

UNIDO – United Nations Industrial Development Organizations

USAID – United States Agency for International Development

WBCSD – World Business Council on Sustainable Development

WHO – World Health Organization

Appendix B:
Excerpts from Interviews Conducted with NCPC Directors
at the 6th Annual NCPC Directors' Meeting,
Seoul, Korea, September 2001

B.1 NCPC Policy Strategies

“Changing laws is a lengthy process. So we don’t try to make new laws unless there is a real need. We hired an environmental NGO to review the laws, and see where are the insertion points [for CP]. But before including CP into the potential existing laws, we need to build a national working group.” (Costa Rica)

“We don’t expect to change any existing laws. We expect to add some avenues to existing regulations, maybe extending or complementing but not changing.” (Vietnam)

“Disseminate and mature the concept of CP through workshops that must include government officials. They’re also a target group for awareness raising for explanation of the CP concept, because in my country the different concepts relating to pollution prevention introduced by different donor organizations have different terminology, so that makes people confused with the nature of the concept.” (Vietnam)

“[The Asian Development Bank] helped us to train people and on how to outline the national action plan. NEA (National Environment Agency) asked VNCPC to help them writing this plan. This was a government project and VNCPC worked as an expert institution.” (Vietnam)

“We invite the person responsible for the environment in the Vice-President’s office to open the seminars as a way to involve these people [the government officials]... We also draft their speeches so that it is a nice way to tell them what we want them to say.” (Tanzania)

“The centre is put under the vice-president’s office. The point I’m trying to make here is that our involvement with policy issues is guaranteed because we have contacts with policy makers.” (Tanzania)

“When the centre was being established, it was the time for the Ministry of Industry and Trade to revise their policy: the sustainable industrial development policy (IDP). I was lucky to be a member of the technical working group. And in that group I tried to hammer the idea of having the environment acknowledged by the policy, and we have a section on the sound environmental management within the policy...and it talks about CP in black-and-white.” (Tanzania)

B.2 Incentives/Opportunities for promoting CP

“We have a directive from the Political Bureau, which is pushing CP. It was published two years ago. The national environmental law was approved in 1993 and became effective in 1994. The Political Bureau helps guide the Ministry on how to implement/strengthen the environmental protection laws. After the directive of 1998, the government had to reconsider its strategies of industrialization to incorporate CP.” (Vietnam)

“Ho Chi Minh has an environmental fund (2.5 millionUSD from ADB plus government funds) available to support the most polluted to build treatment facilities. With the success of these projects, they’ll be able to change the orientation of the projects to contemplate CP projects, and then target small industries. One district of Hanoi also has an environmental fund. VNCPC helps industry to develop the projects to be submitted to the fund. There is also a low interest rate loan available from ADB for small industries to adopt new technology.” (Vietnam)

“It’s now becoming a [good] problem because every one of them wants to talk to us, include CP in their courses, etc. 6-8 colleges have already included CP in their formal curricula.” (India)

“Five universities are teaching CP courses or Programmes and we’ll have 10 more in two years. The relationship is very easy with them.” (Vietnam)

B.3 Limitations/Barriers to Promoting CP

“In many places or institutions in Costa Rica, people are not willing to try different things because they say that maybe they can have their hands burnt or put your head on the line. There’s no good communication or link between the two [Ministry of the Environment and Ministry of Industry]. So in this case CP must push here, push there...” (Costa Rica)

“In India every other environmental institution is working on CP policies, but there’s not much talk going on among the different organizations, no synergy.” (India)

“Percolation of CP into the small industry level, because industry associations, government and other institutions know CP but the real user are small industries. They know what CP is but if you have to comply with pollution control government regulations yesterday, nobody will wait for a month to implement CP measures for a survival issue. And only when the government pressure is lower that the industry starts thinking of CP. (India)

The third important barrier is the cost of capital. In India the most expensive thing is capital. Our interest rate for industry is 14-14.5% in general. So the economic viability of

projects is compromised. The access to capital is also difficult for SMEs because there's not much to guarantee/back them up." (India)

"[Enthusiasm for CP] varies from ministry to ministry. For instance, the Ministry of the Environment wants to promote CP in the policy level and they are very enthusiastic. The Ministry of Industry may agree if they understand what CP is, but if you talk about clean technology they do not agree anymore, because it means investment, they need more money to be able to implement." (Vietnam)

"Building a formal network in Vietnam is not so easy between different organizations because its not so common in the country and depends on the structure of the organizations." (Vietnam)

"You have to have the linkage to the high level people in the country who are involved in making the laws at the very early stage. You have to have the personal contact that you can feed in your CP ideas, and if they understand it, they'll promote it further and quicker. I think this is really depending on your personal reputation and personal network. And if you have both, I think people will listen to you." (Vietnam)

"Before 1994, the government had focused its attention solely on the natural resources. They think there was no pollution in Vietnam before 1990 and the environmental problems were regarding natural resources. Only after that they started developing policies directed to industry development and organization and now they are facing that pollution." (Vietnam)

"It's easier to put things on paper and everybody is enthusiastic about CP but when it comes to the implementation, they're not anymore so enthusiastic because it means change attitude. The first priority to government is to develop industry, so when we ask them to do CP, it looks like additional work for them." (Vietnam)

"It would be fair enough if the provinces enforce the existing national laws, because Vietnam has excellent environmental regulations and laws, but the problem is how to enforce it in all 61 provinces; the agencies are lacking man power, equipment to measure, know-how, and industrial development is far more important than environmental protection. So they don't even enforce what is already existing." (Vietnam)

B.4 Assistance from UNIDO/UNEP

"Show how it works in other countries. Have UNEP talk with the Ministerial level." (Vietnam)

"I think we need a more institutionalised approach where we can actually deal with policy issues, and actually we have a lot of information on the barriers of introducing CP, which has been discussed by different target groups, and we need to compile that information and probably get a more formalized study on policy. But we still need the intervention of UNIDO and UNEP." (Tanzania)

Appendix C:
List of Individuals Interviewed During NCPC Site Visits
(By Institutional Affiliation)

C.1 Brazil

CNTL – Centro Nacional de Tecnologias Limpas: Mr. Hugo Springer, director and Ms. Marise Keller dos Santos, deputy director.

FINEP – Financiadora de Estudos e Projetos: Mr. Rogério Vasconcellos de Sá, Programme and project technician, Department of the Environment.

CEBDS – Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável: Mrs. Márcia Drolshagen, deputy director.

Câmara Municipal de Porto Alegre, RS: Mr. Beto Moesch, local congressman.

CODEMA – Conselho de Meio Ambiente, FIERGS: Mr. Paulo Muller.

SEMA – Secretaria de Meio Ambiente do Estado do Rio Grande do Sul: Environmental State secretary Mr. Cláudio Langone.

FEPAM – Fundacao Estadual de Protecao Ambiental: Mr. Mario K. Soares, chemical engineer.

Independent Observer/Expert: Mr. Eugênio M. Cânepa.

Pro-Guaiba Initiative: Mr. Renato Ferreira, coordinator.

UFRGS – Universidade Federal do Rio Grande do Sul: Professor Luis Felipe Nascimento.

AGAPAN – Associação Gaúcha de Proteção ao Ambiente Natural: Mr. Francisco Milanez.

BNDES – Banco Nacional de Desenvolvimento Econômico Social: Mr. Israel Blajberg, service coordinator.

C.2 Czech Republic

CCPC – Czech Cleaner Production Centre: Mrs. Anna Christianova, director, Mr. Jan Koubsky and Mr. Libor Novak, consultants, and Ms. Klara Ourednikova, information coordinator.

Ministry of the Environment: Mr. Miroslav Hajek, director of the Economic Department.

EMAS Agency, Ministry of the Environment: Mr. Pawel Ruzicka, engineer.

Institute of Chemical Technology, Prof. Jana Puncocharova, Department of Environmental Chemistry, Prof. Josef Vejvoda, Department of Coke, Gas and Air Pollution, and Prof. Vladimir Koci, Department of Environmental Chemistry.

State Environmental Fund, Ministry of the Environment: Mrs. Anna Drevikovska, director.

Sciencetech Inc.: Mr. Milan Tomik, environmental consultant.

Healthy Cities of the Czech Republic (WHO), Mr. Petr Svec, director.

Mr. Vladimir Dobes, former CCPC director.

C.3 Slovak Republic

SCPC – Slovak Cleaner Production Centre: Mrs. Olga Hauskrechtova, project manager, Ms. Renata Kruppova, information centre manager, Mr. Tomas Laurinc, project manager, and Ms. Jana Balenova, deputy director.

Ministry of Economy: Mrs. Marta Ruzickova, director, Mr. Josef Chovan, deputy director of the Department for OECD and International Organizations, and Mr. Karol Visacky, environmentalist of the Department of Economic Policy.

ITPO (UNIDO) – Investment and Technology Promotion Office: Mrs. Dana Vavrikova, deputy director.

Ministry of the Environment: Mrs. Gabriela Fischerova, Department of Air Protection.

ASPEK – Association of Industrial Ecology: Mr. Andrej Soltes, section director.

REC – Regional Environmental Centre for Central and Eastern Europe: Mr. Vladimir Hudek, director.

C.4 Hungary

HCPC – Hungarian Cleaner Production Centre: Mr. Sandor Kerekes, director, Mr. Gyula Zilahy, managing director.

Budapest University of Economic Sciences and Public Administration: Prof. Maria Csutora.

Ministry of the Environment: Ms. Szilvia Oroszlany, Department for Waste Management and Environmental Technology.

Ministry of the Environment: Ms. Andrea Nam, Department for Integrated Pollution Control.

Budapest Department of Environmental Protection: Mr. Istvan Ori, director.

Consact Ltd.: Mr. Miklos Galli, environment division manager, and Mr. Peter Roth, senior consultant.

KOVET – Association of Environmentally Aware Companies: Mr. Balazs Haver, deputy director.

C.5 Mexico

CPM+L – Centro Mexicano para la Produccion Mas Limpia: Mr. Guillermo Roman, director.

FIPREV-FUNTEC – Fondo para Proyectos de Prevención de la Contaminación: Mr. Jesus R. Sanchez, director.

Nacional Financiera: Mr. Orlando C. Portillo, deputy director.

CONIECO – Consejo Nacional de Industriales Ecologistas de Mexico: Mr. Carlos Sandoval, CEO.

SEMARNAT – Secretaria de Medio Ambiente y Recursos Naturales: Mrs. Ana Silvia Arrocha, director.

SEDESU-Queretaro – Secretaria de Desarrollo Sustentable del Estado de Queretaro : Mr. Jose Ramon P. Contreras, environmental subsecretary.

Iniciativa GEMI SA: Mr. Alejandro S. Reyes, director.

BANORTE: Mr. Jorge L. M. Gutierrez, deputy director.

UNAM-ACATLAN – Universidad Nacional Autónoma de México: Prof. Araceli Parra.

Municipio de Naucalpan: Mr. Oscar J. Z. Arenas, director, General direction of ecology, and Mr. Cesar G. H. Guardado, deputy director.

ITESM – Instituto Tecnológico de Monterrey: Prof. Gabriela C. Velazquez, and Prof. Nydia S. Reynaga.

CANACINTRA - Cámara Nacional de la Industria de la Transformación: Ms. Gracia G. R. Palacio, deputy director.