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## Vietnam National Cleaner Production Center

US/VIE/96/063

Report of the evaluation mission\*

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*This report expresses the viewpoints of the evaluation team and does not necessarily reflect the position of UNIDO/UNEP, seco or national Vietnamese authorities.*

## Abbreviations

ADB	Asian Development Bank
BP	Business Plan
CECE	Center for Environmental and Chemical Engineering
CP	Cleaner Production
CTA	Chief Technical Advisor
DOSTE	Department of Science, Technology and Environment
EIA	Environmental Impact Assessment
EMS	Environmental Management System
FDI	Foreign Direct Investment
GHG	Global Greenhouse Gases
HUT	Hanoi University of Technology
INEST	Institute for Environmental Science and Technology
ITTEP	Institute of Tropical Technology and Environmental Protection
MF	Ministry of Finance
MOET	Ministry of Education and Training
MOI	Ministry of Industry
MOSTE	Ministry of Science, Technology and Environment
MPI	Ministry of Planning and Investment
NCPC	National Cleaner Production Center
ODA	Official Development Assistance
SDC	Swiss Agency for Development and Cooperation
seco	State Secretariat for Economic Affairs of Switzerland
SME	Small and Medium Enterprises
SOE	State Owned Enterprise
TQM	Total Quality Management
UNEP	United Nations Environment Program
UNIDO	United Nations Industrial Development Organization
VCCI	Vietnam Chamber of Commerce and Industry
VNCPC	Vietnam National Cleaner Production Center (VNCPC)

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## Summary

The demand for CP services in Vietnam is rather weak and will probably not grow quickly in spite of the fact that industry has a considerable potential to reduce pollution and achieve financial benefits through application of cleaner production. This is due to low resource prices, no or low discharge or disposal fees and the economic framework which lacks incentives to enterprises to behave profit oriented. The motivation of private firms is mainly on reducing costs which is basically reduced inputs from materials or reduced energy consumption. SOEs on the other hand only behave to a limited degree according to market oriented management principles thus asking for other incentives to adopt CP. On the other hand, awareness and acceptance of CP as an appropriate method to reduce industry-generated pollution has progressed in particular at policy and institutional levels so that there exists policy support for CP programmes in general and for the VNCPC in particular. These two facts support on-going relevance of the project.

In less than one year and a half of intense implementation the project has achieved or surpassed most of the quantitative indicators relevant for the period under evaluation. The project surpassed in particular targets set for training CP assessors which has been the lead activity in this period (Phase 1). The project also has been effective and achieved results commensurate to the short duration of the project in awareness raising and in identifying and establishing contacts with partner organizations. Some results have been achieved also in policy dialogue.

The main objective of Phase 1 – building up national capacity in CP – has not been achieved yet. Both the VNCPC staff and other trainees participating in the training programme for CP assessors, while well trained in concept and methodology, need more extensive practical experience from in-plant assessments.

Future activities and Phase 2 in particular need to focus on accelerated upgrading of VNCPC staff to conduct in-plant assessments as lead auditors. Further it will be desirable to extend the network of potential allies in CP dissemination, to establish closer cooperation with them in order to help them in CP marketing and application and to intensify policy dialog. The VNCPC needs to upgrade its management and marketing capacity. This includes developing also training and assistance to CP auditors in how to introduce management changes, combine CP with simple management systems and the identification and promotion of incentive schemes in companies to make CP a sustainable issue at enterprise level. Improved marketing can include the following aspects: More usage of allies with their own products, services and clients. Link CP services to related ones such as EMS, quality management, energy efficiency, end-of-pipe measures, technology cooperation, reengineering, SME business development services etc. The project strategy needs to be reviewed with the purpose for the VNCPC to become business-oriented and to address problems of sustainability of the CP programme. Consequently, the business plan needs to be revised accordingly.

## 1. Introduction

The Vietnam National Cleaner Production Center (VNCPC) contributes to the promotion and dissemination of the concept of Cleaner Production (CP) in Vietnam. The VNCPC intends to act as a national focal point for CP capable of performing a catalytic role in improving the environmental performance of Vietnamese industry. The program was designed on the basis of an analysis of the country specific conditions in Vietnam and the experience UNIDO/UNEP has gained through establishing National Cleaner Production Centers in more than 10 countries, including China and India. The VNCPC is hosted by the Institute for Environmental Science and Technology of the Hanoi University of Technology.

The project is divided into two phases. In the first phase, the focus is on conducting pilot activities to prepare the VNCPC to take the lead in a country-wide application of the concept of CP. In the second phase, the focus will be on preparing the VNCPC for sustainability. The second phase demands thus also a more business oriented approach as CP ideally should become normal business practice in a significant amount of Vietnamese enterprises.

The mid-term in-depth evaluation has as purpose to enable stakeholders to take decisions on the future orientation of the project. Specifically the evaluation addresses the issues of overall project design and implementation and the efficiency, effectiveness and impact of the specific project activities as well as considerations about the sustainability of the project (for detailed TORs see Annex 1).

The evaluation team was composed of Jürg M. Grütter (Team leader, independent consultant, appointed by seco), Jaroslav Navratil (staff of UNIDO headquarters, appointed by UNIDO) and Phung Chi Sy (appointed by the Government of Vietnam). Annex 2 contains the meetings the evaluation team realized during its 2-week stay in Vietnam.

The time frame considered for the evaluation was from project start to end 1999. This is especially relevant concerning results and activities performed. In the qualitative part however some new activities and experiences made in the year 2000 are included.

## 2. Project Concept and Design

### 2.1. *Socio-Economic Context*

Industrial development in Vietnam in the past and the present was and is quite fast. In 1998, the industrial growth rate was 12.1% (13.2% in 1997). Since 1993, industrial output has grown at an average 13 percent annually. The number of state-owned enterprises (SOE's) has reduced from more than 12 000 to 1 880 (1996). In 1996 the existence of over 600 000 private enterprises was reported, most of them active in the commercial sector. The fastest growing sectors in period from 1995 to 1997 are radio, TV and telecommunication equipment (75%), chemical (43%), rubber and plastic (38%) and garments (38%). The MPI expects that by year of 2000, the industrial GDP will represent more than 35 percent of the total GDP.

Vietnam is just beginning its industrialization and modernization process. The rapid growth in industrial sector has resulted in serious environmental problems in certain areas. The industry has been typically addressing this problem with an "end of pipe" approach. The CP concept is fairly new in Vietnam, so at the present, the market for CP is still very small. Furthermore, the motivation system in the big state-owned enterprises is usually not conducive to application of CP measures.

The Vietnam Government has recognized the magnitude of environmental degradation caused by industrial development and the need to better monitor and control environmental performance. The legal as well as organizational framework for environmental policy has been built up in recent years, with the establishment of the National Environmental Agency (NEA) within MOSTE and the Environmental Management Division within DOSTE at cities and provinces levels. According to the Law of Environmental Protection and Article no 17 of the Government Decree 175/CP (1994), owners of existing plants should prepare EIA reports and submit them to MOSTE or DOSTE. In June 1998, the Politburo of the Vietnam Communist Party Central Committee issued its Directive on strengthening environmental protection in the process of national industrialization and modernization. "Priority should be given to the adoption of cleaner, low or non-waste, raw material and energy efficient technologies". This must be encouraged by creating incentives of taxation and credit policies.

## 2.2. *Institutional Framework*

MOSTE, through the NEA, is the prime responsible authority for administration of the Law of Environmental Protection. Enforcement of regulations, both national and provincial, is responsibility of the DOSTE in each province. The DOSTE is accountable to MOSTE and the Provincial People's Committee. Another institution at the national level that has an influence on investment in the field of environment is the Ministry of Planning and Investment (MPI). The Department of Science, Education and Environment (DSEE) is the unit in charge of environment. The Ministry of Industry (MOI) and the Ministry of Agriculture and Rural Development (MARD) also have environmental units.

Many international organizations are working in the environmental field in Vietnam. The inception report contains the major on-going or planned projects and UNDP also prepared a report on environmental projects in Vietnam.

## 2.3. *Relevance*

The Vietnamese economy continues to grow, although not at the same pace as in former years, especially concerning FDI. 1996 FDI had reached 8.3 billion USD a year, accounting for more than a third of Vietnam's GDP. 1999 FDI fell back to less than 2 Billion USD or below 1992 levels. This reduction is not caused mainly by the financial woes of Asia, but basically by the overlooking of political and economic realities by investors themselves.<sup>1</sup> (Vietnam did not receive heaps of "hot money" as it has a non-convertible currency, a rudimentary banking system and no stock markets.) The impact of the economic downturn (in relative terms as Vietnam is still growing) on the project and CP promotion is basically a reduced interest in CP applications by enterprises. This is due to a tighter financial situation, a reduced willingness to pay for external services as a result of cash shortages at enterprises and reduced willingness of the government to apply and enforce new environmental measures or to increase resource prices. Consequently, there is a higher potential interest for CP measures with a quick payback, low investment and with the opportunity of increasing short-term competitiveness.

Environmental degradation and especially pollution continues to be a critical topic in Vietnam although various initiatives and a great deal of ODA is being invested in environmental matters. Industrial pollution is a major impediment for sustainable development. The scarcity of economic resources calls for an Eco-efficient approach towards pollution instead of the traditional end-of-pipe approach followed by industrialized countries in former years. CP was thus identified by the project to be an efficient approach to contribute to sustainable development. This appreciation remains valid and is also being shared increasingly by other organizations. This is reflected in an increasing number of projects which contain CP elements (e.g. ADB, Canada) and a shift towards higher priority of CP in

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<sup>1</sup> See e.g., The Economist, January 8<sup>th</sup> 2000

the environmental policy of Vietnam as reflected in the now high priority of CP in the new National Strategy for Environmental Protection 2001 to 2010.

## 2.4. *Project Design*

### 2.4.1. Bases

Project design is based on the official project document US/VIE/96/063 dated October 13<sup>th</sup> 1997 and an Inception Report, dated August 1999 which is also based upon a workshop held on 23 and 24<sup>th</sup> of March 1999. The Inception Report contains a Business Plan. These documents give an extensive description of the current situation in economic and environmental terms in Vietnam, on-going and planned CP activities and the CP approach. The project was divided into a first phase with the aim of creating the basic infrastructure and the capacity for CP in the country and a second phase with the basic goal of a widespread dissemination of the CP concept based on the capacity built up in the first phase. To achieve these goals four major activity components were identified: In-plant demonstration, training, information dissemination and policy advice/finance. For each area objectives were defined, and strategies to attain latter. Also per area activities for the first phase and the corresponding budget were defined. For the first phase the major thrust is in training linked with in-plant demo-projects accounting for about 2/3 of the project resources. An institutional layout was also realized. Indicators for the first phase were partially developed, based on the project activities and on the UNIDO indicator scheme. The Business Plan contains the VNCPC mission, a description of the economic, environmental and institutional context, potential competitors, objectives, the center's strategy, the organization and a budget.

### 2.4.2. General Valuation

Basically the project documents are descriptive in nature and give a good overview of the current situation, the institutional players in the field and activities to undertake. These activities are thereafter outlined fairly detailed for the first phase. The concept of first developing a capacity and thereafter disseminating the results based on the experiences and the built-up capacity is convincing. The main focus is on the Inception Report, which is very similar to the official project document. It contains as Annex a Business Plan (BP). This BP lacks a business oriented approach and is fairly weak in the identification of different potential clients such as industry, consulting and training institutions or policy makers and their real demand. It also lacks a discussion of potential allies and problems in the diffusion of the concept. Problems related to financial sustainability are left for discussion in the second phase. In the following paragraphs the major shortcomings and their implications of the BP are outlined. Although the BP is not a core document of the project till now and in practice the VNCPC has already been client-oriented, a more business oriented approach in the second phase requires a precise BP. The following critical elements can thus be seen in the light of focusing in the second phase more on a business oriented approach and do not imply a critique of actual approaches applied till now.

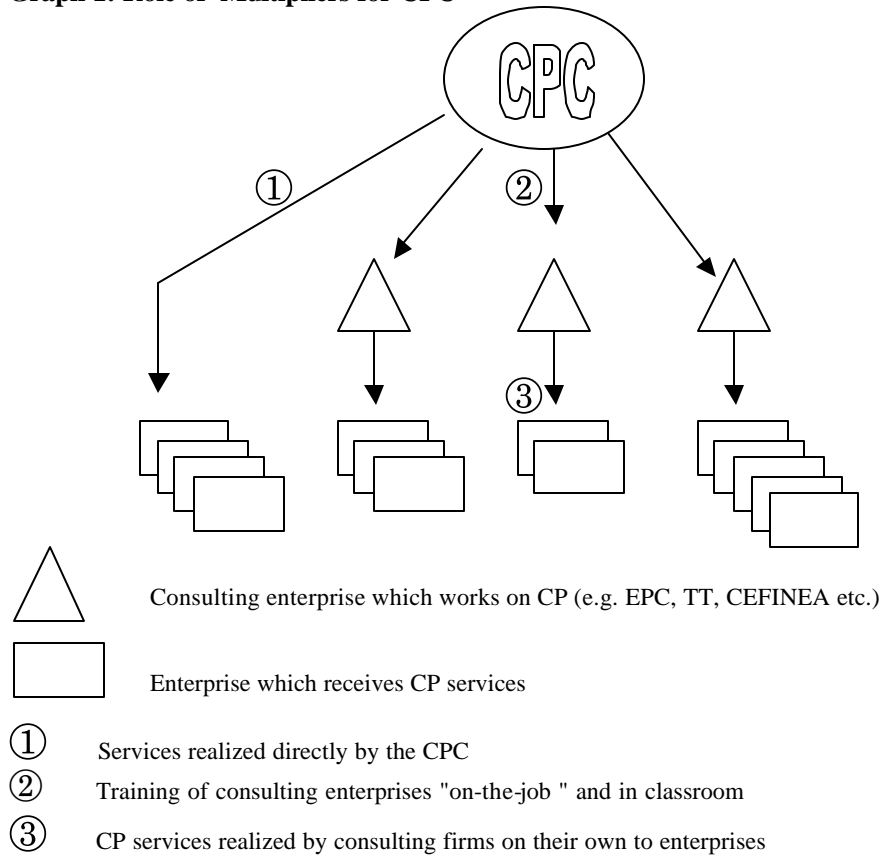
### 2.4.3. Mission and Core Focus of the Center

The mission of the center is based on being a focal point and a catalytic agent of CP promotion in Vietnam. However in the mission itself it is stated that it will attain this through delivering services such as training, in-plant assessments and financing advice among others. Also frequently the term of Center of Excellence is used. The role of the center is thus not clearly stated as being mostly a direct provider of services to industry or being more of an intermediate institution which promotes a market for CP and reinforces existing structures and economic agents in this or related fields. The potential for creating "unfair" competition to other suppliers thus exists as well as the reluctance on part of the host to share financial as well as personnel resources with other suppliers (e.g. other environmental institutes in the country) which are perceived as competitors and not as allies. This is reflected, e.g., in the statement of the director of the INEST, the host of the center, who considers it important to fortify the VNCPC to be able to compete with other centers and to win "bids". The business plan also identifies other environmental centers as competitors to the VNCPC and not as potential allies. It



should be clearly outlined that the center in the medium and long term acts primarily as promotional force enhancing and upgrading the CP market working with other agents together as allies. To achieve this target however the center also has to realize, at least in the short term, direct activities with clients. Graph 1 describes this situation:

**Graph 1: Role of Multipliers for CPC**



Part 1 services are mainly made at the beginning, when the market for CP is new and developing and decreases relatively in importance over time. To achieve a growing and sustainable CP market it is important to upgrade other institutions which can work with enterprises on CP assessments. In practice the center has already included trainees from other institutions - to gather momentum as a market force this approach however has to be deepened.

2.4.4. Objectives and Goals

The overall Development Objective as expressed in the project document is too remote from the Immediate Objectives (the relation is weak) and a clear formulation of the Project Objective is missing.

2.4.5. Strategies

In the Business Plan, the center's strategy is a clear supply approach trying to sell its basic services. Clients are not identified clearly but only potential target groups and their potential needs. However no demand assessment and no relation to experiences of other related projects, e.g., in the field of industry promotion concerning the willingness of clients to pay for services is made.

#### 2.4.6. Dissemination

The aspect of dissemination is left to the second phase. The importance of incorporating allies, to combine CP with related activities such as EIA, EMS, SME promotion and others as well as the importance of policy changes are not sufficiently reflected. It is important to extend and elaborate those elements of dissemination which already are in the project document and to build up on the experience acquired through cooperation with the partners. The risk should be minimized of having trained people with a good concept but without market and demand from clients and without knowing how to get to clients.

#### 2.4.7. Financial Sustainability

The aspect of financial sustainability reflects the lack of a business approach to CP. Financial sustainability is described in short as means to seek for external resource, with a target of about 30% self finance. This target is not defined adequately (30% of total or only national costs; what is included in the income). Currently self finance through user-charges is 0 and national finance as percentage of total national expenses accounts for 12%, and even less than 5% of total expenses. The concept of charging fees for services and thus creating a demand and client oriented approach as well as having a direct quality control of services is not an element of the business strategy devised. This is questionable as one of the major findings of an international cross-comparison study financed by seco and US-AID was that it is essential to charge - from the start - at least partially for services. Also environmental centers in Vietnam are normally very business oriented, as they have to cover a considerable part of their expenses through service contracts, thus facilitating such an approach. The self-finance rate of the host is surely a positive sign. However this in no way guarantees the sustainability of the CP services inside INEST – to the contrary, if CP is no business for INEST it will not continue this service as INEST is also driven very much by business interests.

#### 2.4.8. Risks

Potential risks to the project as described in the project documents remain valid. In the first phase they do not interfere with the project as the project is very much internal oriented in this phase. Risks are however associated to a considerable extent on the outreach and the demand for CP services as reflected by pressures on companies to implement changes (law enforcement, energy and resource pricing) and the willingness of companies to invest in CP assessments and changes.

### 3. Implementation

#### 3.1. Time Frame

The agreement between the Swiss Government and UNIDO was signed in March 1998 and the project document was signed in April 1998. While interviews of candidates for national experts were conducted already in May 1998, three national staff were recruited in June 1998 and some other activities started in July 1998 (a study tour), the CTA visited the VNCPC for one month only in November 1998 and resumed his duties in February 1999.

November 1998 is viewed by VNCPC, UNIDO and the donor as the beginning of Phase 1, therefore November 2000 is considered as its end (and beginning of Phase 2). This reflects the time frame of intensive and continuous project activities.

### 3.2. Budget and Expenditures (Phase 1)

The original budget (April 1998), the revised budget (February 2000) and expenditures (February 2000) broken down by main budget items are specified in Table 1. Budget revisions, which have been well justified, have not been large so that they have not changed the structure of budget allocations.

**Table 1: US/VIE/96/063 - Vietnam NCPC (Budget and Expenditures)**

Budget line		Original Budget	Latest Revised Budget <sup>2</sup>	Total expenditures <sup>3</sup>
11-99	Project Personnel	564,000	564,408	299,313
13-00	Secretarial Support	12,000	7,450	2,207
15-99	Project Travel	45,000	79,000	38,169
16-99	Other Personnel Costs	15,000	33,000	13,100
17-99	National Consultants	112,800	124,084	61,433
19-99	Personnel	748,800	807,942	414,222
29-99	Contracts	35,000	25,900	12,900
32-99	Study Tours	105,000	95,000	62,863
33-99	In-Service Training	80,000	66,000	30,000
39-99	Training	185,000	161,000	92,863
41-99	Expendable Equipment	25,000	8,000	8,000
42-99	Non-Expendable Equip.	87,000	4,075	4,075
45-99	Local Procurement		106,924	91,121
49-99	Equipment	112,000	118,999	103,196
59-99	Miscellaneous	60,000	26,159	10,995
<b>Total</b>		<b>1,140,800</b>	<b>1,140,000</b>	<b>634,176</b>

The largest cost item of the budget is personnel costs (70%). Out of these, the international experts account for 50% and the Chief Technical Advisor alone for 38% of the budget. Budgetary allocation for national consultants (\$ 124 084) is used mainly (by 84%) for funding national staff of the VNCPC, the remaining part is allocated for short-term national consultants. The second most important budgetary item is training (14%). It includes study tours (for VNCPC staff and staff from related Government bodies and organizations) and budgetary requirements related to the training program of the VNCPC. (Total costs of the training program are, however, higher as they also include costs of the international experts recorded under the budget line 11 - Personnel.)

Compared to other institution building projects, the equipment component does not use up a large share of the project (10%). However, compared to other UNIDO/UNDP NCPC projects the VNCPC project has a considerably larger allocation for laboratory equipment.

As of 29 February 2000 (the most recent data available at the time of evaluation) the project spent 56% of its total budget, with higher percentage of expenditures in the case of equipment (87%) and slightly lower percentage of personnel expenditures (51%). Both the overall level and the deviations among cost items are commensurate to the time frame of the project.

<sup>2</sup>Budget revision as of February 2000

<sup>3</sup>Expenditures as of 29/2/2000

### 3.3. *Delivery of UNIDO Inputs*

#### 3.3.1. Personnel

UNIDO provided a full-time Chief Technical Advisor (CTA), five short-term consultants (some of them on split missions), and national experts working as VNCPC staff. The quantity corresponds to the project document except for national experts: the number of long-term national experts paid by UNIDO is larger than the input indicated in the project document (three staff) whereas inputs of short-term national consultants has been smaller than planned. Additionally a UN volunteer with a very relevant professional background was seconded to the project.

The project also recruited the secretary and subsidizes the salary of the driver.

The overwhelming majority of international experts were recruited either from the twinning organization (FHBB, Switzerland) or from the NCPC in India. Their quality (qualifications, experience) was very good and generally recognized. Two short-term consultants were recruited from the Asian Institute of Technology in Bangkok. Recruitment and arrival of the CTA were delayed by a couple of months that delayed the start up of the project.

Two short-term consultants from the NCPC India were critical in supporting the CP teams in their in-plant assessments. As the in-plant assessments also have a function of on-the-job training, the input of the two consultants can be singled out as the most important factor not only of the progress achieved in identification of CP options in the participating companies but also as key factor of capacity building in conducting CP assessment.

The first three national experts were selected from 28 applicants and recruited in June 1998, the fourth one was recruited in September 1999. All of them are from the host organization INEST. All of them have adequate professional background, two of them are senior experts with Ph.D. degree. All of them have the potential to upgrade and diversify their qualifications to carry out VNCPC activities but this process still needs to be continued and intensified.

#### 3.3.2. Training

UNIDO provided two study tours and a number of possibilities for the VNCPC staff to attend international and national seminars and workshops. The first study tour was carried out in July 1998 (Czech Republic, Thailand, 10 days). In addition to the three VNCPC staff the study group included two other staff of INEST (including the National Project Director), MPI and DOSTE from Thai Nguyen province. The second study tour in September 1999 (Slovakia, UNIDO HQs, Switzerland) included a policy component so that a number of participants were from policy or regulatory bodies (Ministry of Planning and Investment, Ministry of Finance, Ministry of Industry, National Environmental Agency). Both study tours were appreciated by the participants and contributed to developing informal linkages of the VNCPC with its institutional partners. Intentionally, most of the participants from the second study tour became members of the core team chaired by NEA which should prepare a National Action Plan for Cleaner Production.

Participation of staff at seminars and workshops abroad (Switzerland, Australia, Sweden, India) is a useful tool to upgrade knowledge and enhance motivation of staff. As such it can play a significant supporting role in capacity building. However, the main avenue for upgrading the know-how of the staff is their active participation in conducting VNCPC services, in particular on-the-job training during the in-plant assessments in the factories. The VNCPC is already focusing fairly strongly on this type of training.

#### 3.3.3. Equipment

UNIDO provided a car, some office equipment and laboratory equipment. The car and office equipment were delivered as planned (office equipment more than planned) and are used. Delivery of

laboratory equipment has been accompanied by problems resulting from strict application of UNIDO procurement rules (the need to apply competitive bidding for more expensive equipment). Furthermore, since the VNCPC requested laboratory equipment exceeding and deviating from similar requirements of other UNIDO/UNEP National Cleaner Production Centers and from a list of equipment recommended by the NCPC India, UNIDO requested justification for the procurement of equipment specified by VNCPC. This caused dissatisfaction on the part of VNCPC and slow reaction. As a result of the above factors, the delivery has been delayed.

However, what is more important is the fact that use of what is available has been rather limited. It is now planned to complement a mobile kit and to train staff in using it. This needs to be done soon so that the equipment can be used by the VNCPC staff when visiting industrial companies.

### **3.4. Delivery of the Government Inputs**

In accordance with the project document the Government (HUT/INEST) provided on time adequate air-conditioned office space and laboratory premises to accommodate laboratory equipment. The office space is of very good quality. INEST also provided furniture, telephones and some office equipment.

Among Government inputs there is a commitment to provide an in-kind contribution of VND 2 billion (approx. \$ 143 000) to the project. The in-kind contribution for 1998-99 was estimated at \$ 35 000, rent excluded. It covers the above investment inputs (renovation of the office space, furniture, etc.) and some operating costs (Government salary of the driver, electricity bills, maintenance.) Market value (rent) of the office space provided by HUT can be estimated at US\$ 7 200 per year.

Office supplies are procured by UNIDO and the salary of the driver is subsidized by UNIDO. The fact that some Government inputs have not been delivered fully (such as office supplies) has not affected adversely operations of the VNCPC since they have been provided (paid for) by UNIDO.

### **3.5. Activities in the Field**

More intense activities started after the visit of the CTA (November 1998) and his resumption of duties in February 1999. In March 1999 an inception workshop was conducted with large participation of a broad spectrum of stakeholders and invited guests such as representatives of NCPCs in India and China. The Inception Report prepared by the VNCPC on the basis of the inception workshop to some extent repeats conceptual approaches described in the project document and elaborates in more detail their implementation, including project activities schedule and performance indicators for Phase 1. It also estimates activity-specific budgetary requirements ("direct costs") which can be related to the main categories of VNCPC activities in Phase 1:

**Table 2: Direct Estimated Costs of CPC Services**

<b>Item</b>	<b>Estimated Cost in USD</b>
In-plant demonstrations	126 000
Training	124 000
Information dissemination	52 000
Policy advice	61 500
<i>Total</i>	<i>363 800</i>

Up to now the activities focused on training and in-plant demonstrations as integral part of the training process. Activities to disseminate information were confined to six awareness raising seminars till end 1999, policy related activities consisted in support to MOSTE and NEA in drafting

national environment strategy and preparatory work for national action plan for cleaner production. (For further details see chapter 4.)

### ***3.6. Cooperation and Networking***

#### **3.6.1. Institutes and Centers**

The VNCPC has established good working and personal relations with a number of institutes and centers (CEFINEA, CEETIA, EPC, CECE and some others) as well as some university departments. These organizations have professional expertise in environmental technology (usually end-of-pipe treatment) and/or process technologies. Most of them have contractual contacts with industry. As their revenue depends to a large extent on such contracts, they have developed businesslike approaches and have access to an array of industrial establishments. Thus they could function as allies of VNCPC in promoting and implementing CP programs in the framework of their activities. VNCPC understands and makes use of this opportunity: all the above mentioned centers were offered participation in the training program. As the participation is limited to one or two staff from each institute it probably does not represent a critical mass to make a significant difference in the work of the institute but a nucleus to develop CP oriented activities is laid. In some cases (EPC, CECE) the institutes have clear strategies how to create and enter the market of CP services (helping companies prepare bankable projects to access soft-term loans, combining end-of-pipe treatment with cleaner production, etc.). At least in one case the participant in the program brought to the program a company for which he/she worked as a consultant prior to the CP program.

VNCPC also cooperated with some of these institutes in organizing awareness raising events (particularly in the South). The institutes usually provided logistical support to such events. So far they have provided it on voluntary basis but they expect that such support and cooperation will become at least cost recovering in the future.

Cooperation with such institutes and organizations can be further intensified by arranging tailor-made training courses for their staff and contracting their professionals for VNCPC-organized in-plant assessments in companies which are ready to identify and implement more complex CP options.

#### **3.6.2. Policy and Regulatory Bodies**

The VNCPC has established very good working and personal contacts with DOSTE in the large cities and some provinces as well as with relevant ministries and their agencies (in particular MOSTE, NEA). Good contacts were established also with the Ministry of Finance and recently also with some Departments of Industry (such as in HCMC). These contacts have been instrumental in selecting companies for the training cum in-plant assessment program. They also played an important role in raising awareness about cleaner production. Some of the DOSTE are keen to increase their role in the CP program but as a monitoring body they should not aim at providing advisory services or conducting in-plant assessments in companies.

On the basis of their experience VNCPC learned that DOI has better chances to outreach to industry and plans to intensify cooperation with them.

VNCPC is also well connected to MOET and MOSTE that facilitates integration of CP in curricula at different levels of education and reflection of the CP concept in policy and strategy papers. VNCPC has been and will be involved in preparation of the national action plan for cleaner production. However, to become more effective in supporting creation of CP conducive environment it is important to extend linkages also to MOI and provincial Peoples Committees, to review in discussion realistic policy tools and to push for specific policy changes.

### 3.6.3. The Business Community

The Vietnam Chamber of Commerce and Industry (VCCI) is an umbrella organization for all industrial associations. It has outreach to 20000 businesses, including all large industrial companies and many SMEs. It has particularly strong links to exporting companies. All this makes VCCI a very important partner for VNCPC. There is a potential to make use of the VCCI dissemination mechanisms (bulletin, seminars) and their branch offices in provinces to outreach to industry in large or to some segments of industry in particular. One staff of VCCI participates in the on-going training program of VNCPC but otherwise the cooperation was limited. More intensive cooperation is planned and some steps have been undertaken in this direction.

### 3.6.4. Other Projects

There are numerous multi and bilateral projects supporting cleaner production in Vietnam. VNCPC provided information and advice to the ADB project supporting preparation of a national action plan for cleaner production and to the UNEP project on CP financing. Working contacts and exchange of information have taken place with some other projects (such as VCEP, DANIDA, SIDA, WORLD BANK) but these contacts have been rather loose and occasional or they are at an early stage of implementation. Some of these projects could use the expertise of VNCPC once consolidated.

Contacts and alliances should be established and cultivated also with projects and organizations operating outside the traditional CP area but in related activities, such as energy efficiency, quality management, waste treatment, business development services for SMEs, etc. While energy conservation measures have been identified in most in-plant assessments organized by the on-going VNCPC program, attempts to establish close cooperation with competent local organizations and/or projects in this field have been modest. Organizations and projects mentioned above could well integrate the CP concept in their mainstream activities. This will contribute to broader implementation of cleaner production and to positioning VNCPC as pivotal organization for cleaner production. It is, however, understood that such alliances can be effective only if the VNCPC has professional capabilities that are recognized by others.

## 3.7. *Management of VNCPC and Project Management*

The project is executed by UNIDO but the VNCPC, which is supported by the project, was conceived as an independent entity which has its own management structure and is set in the institutional framework of the country. VNCPC is hosted by INEST. The Director of INEST, Prof. Dinh Van Sam, is at the same time the National Project Director who monitors the project on behalf of the Government, is responsible for the contribution of the Government to the project and approves documents before they are submitted to the review meeting or the Advisory Board. The Director of the VNCPC assumes the overall management of the Center, in particular prepares business plans, work plans and budgets.

Given the institutional setting the VNCPC has close working relations with reporting obligations (submission of annual reports) to the Ministry of Education and Training.

The Advisory Board was established to give strategic advice and facilitate integration of the VNCPC in the institutional framework. It is chaired by the Vice-Minister of Education and Training and consists of 11 members representing ministries (MOET, MOI, MOSTE, Ministry of Finance, MPI), universities, UNIDO and the donor. Business community is represented by the VCCI.

The above arrangements are rather standard and their effectiveness depends primarily on the persons in discharge of their functions. The Director of VNCPC has a dynamic and client-oriented approach with very good capabilities to manage and market the center. He has deep understanding of the mission of the Center as a catalytic agent for cleaner production in the country.

The National Project Director stresses the role of the VNCPC as a center of excellence for CP in-plant assessments and, in this context, urges more extensive and long-term training of the VNCPC staff (to upgrade their degrees) and more laboratory equipment. This approach would require conceptual changes of the project document. The evaluation mission also stresses the need to upgrade the qualifications of the VNCPC staff but considers on-the-job training as a more effective path to achieve it.

The Advisory Board met for the first time in January 2000 and the plan is for two meetings per year. Some members of the Board sent their alternates, the representative of the key target beneficiaries (VCCI) was absent. Prepared statements by Board members were not followed up by a true discussion of topical issues. Apparently it will take some effort to develop the Advisory Board into a platform for discussing strategic issues of cleaner production and a vehicle of high-level support for VNCPC activities. In such a way the Advisory Board can distinguish itself from annual review meetings. (The first review meeting took part in August 1999 in full attendance of all key stakeholders.)

On UNIDO side the responsibility for the implementation of the project rests with the Project Manager in UNIDO Headquarters. The CTA assist the Director in his managerial function and advises all the staff in designing and implementing VNCPC activities. (He has himself actively participated particularly in awareness raising seminars, in the class training and in kick-off meetings at some companies.) At the same time he serves as the official contact point for UNIDO in the project. Authority to approve expenses rests with the UNIDO Project Manager but for selected local expenditures (such as project travel of national consultants on BL 15, in-service training on BL 33, consumable equipment and supplies on BL 45 and sundries on BL 41) this authority is delegated to the CTA within advance amounts made available by UNIDO Headquarters. Again, this is a standard arrangement and it depends on the people how effectively it functions. Cooperation between the CTA, the Director and the VNCPC team is reported as outstanding. Project files also record very intense communication between the CTA and UNIDO Project Manager, with clear indication of mutual trust. They deal frequently with conceptual issues and orientation of the VNCPC work. The CTA appreciates particularly the advice of the Project Manager as regards preparation of plans and reports and his transfer of experience of other Centers. Being himself a highly qualified technical expert the CTA seeks advice on technological aspects of specific CP measures, if needed, either at his home institute (FHBB) or other specialized sources of technology information. No direct contacts have been established with technical experts at UNIDO headquarters (in field such as food processing, textile, energy conservation). UNIDO office in Hanoi was in close contact with the VNCPC and supported it particularly in the initial stage of its operations.

Apart from the case of delays in delivery of laboratory equipment as described in Chapter 3.3.3 no other significant problems in managing the project by UNIDO have been reported. Sometimes it was necessary to urge Headquarters to replenish the advance allocation for local expenditures on time.

However, the budgetary methods of UNIDO are not very conducive for a business-oriented approach. The allocation between local and international costs reflects more the principal of where the bill is paid. It does not distinguish if this expense is a national one, which will continue after terminating external assistance or if the expense is for international experts and project management which can be considered as start-up or temporary items. National project staff is, e.g., under the payroll of UNIDO and is thus considered in the international part, while in other countries project staff is paid by counterparts and thus appear under national costs. Thus the VNCPC, unless it requests it from UNIDO, does not have a complete overview of costs it incurs in (national as well as international) expenses - for a business oriented company it is however a basic element to know its costs and to have an idea of which services make profit and which ones make loss and to which extent.



## 4. Results

### 4.1. *Outputs*

#### 4.1.1. Quantitative Appraisal

Performance indicators for the phase I were defined in quantitative terms in the inception report and agreed upon in the Tripartite Meeting held 8/99. The following Table gives an overview of the goals set and their achievement till end 1999.

**Table 3: Results of the VNCPC**

Activity	Goal Phase I <sup>4</sup>	Achieved till end 1999	Comment
In-plant assessments <sup>5</sup>	10	15 ongoing	No finished assessments, 15 enterprises are currently performing the assessment
Trainers course	1 with 30 participants	1, 37 participants, ongoing	Additional 10 participants from companies participating in in-plant assessments
Specific CP workshops <sup>6</sup>	4	2	Sector specific workshops of 3 day duration with 112 participants; curricula workshop held 3/00
Total Person Days Trained	690	1354	Includes trainer course and specific workshops
Awareness raising seminars <sup>7</sup>	13-15	6	282 persons participated, 50% from industry; additional 8 presentations in forums, seminars and workshops organized by third parties
Policy advice	2 study tours, 2-3 forums, 1 seminar	1 study tour	Attended by representatives from 5 key ministries, participation in drafting new environmental policy; the cleaner production declaration was signed by MOSTE with assistance of the NCPC
Publications	8-10 articles in newspapers, translations	2 articles and 2 translations	
Database development	3	0	Database for industry, national and international CP experts
Improve laboratory	completed	in process	Equipment arrived late
Set up library	Completed	in process	

In general the benchmarks as formulated in the inception report have been surpassed or are in line with targets, outset for the whole period of the first phase. Training as well as in-plant assessment goals will probably be surpassed while policy goals as well as publication goals will probably not be met completely, although it is normal, that a new project first concentrates on building up reputation and in country know-how before entering the field of policy advice, so that an increased intensity level of activities in the policy field can be expected this year. The library has not been set-up completely. However the experience of many CPCs worldwide shows that information services are not used frequently except for internal staff and partially by students. It is however not a mean to

<sup>4</sup> 2 year period ending 11/00

<sup>5</sup> The project only makes in-plant assessments together with training in Phase I

<sup>6</sup> Includes 3 sector specific and 1 curricula development workshop

<sup>7</sup> of these 3 sector specific ones

expand CP to direct clients of the center and the cost/benefit relation for this activity is rather poor. The center should therefore revise well the goal of putting up a library and for whom it is made.

Compared to other new CP projects, e.g. in Central America or in Colombia, results for the first year are similar, although the emphasis is clearly more on training in this project compared to other ones, which have achieved more results in in-plant assessments. Other centers also conduct quick surveys or quick assessments to identify CP potentials and get new clients on board.

#### 4.1.2. Qualitative Appraisal

Concerning the quality of the main outputs following comments can be made at the current stage, in which final outputs i.e. persons fully trained, enterprises with completed assessments etc., have not yet been produced:

- **Training** is generally appreciated and considered very positively by participants as well as by institutions which send persons to attend the training. The minimal drop-out rate also reflects a good quality training. Trainees participate actively in the modules and follow discussions. In technical or sectoral matters however participation was restricted to persons from the same sector and trainees from other sectors tend to get less interested. It can be questioned if sectoral issues are of interest to all parties and could not be included in sector specific training, thus shortening the basic training and including more participants of the specific sector in short term special courses, e.g., for textile or food processing. Evaluation from courses in general showed high satisfaction of participants, although the value of such course evaluations is in general not very high, as seldom negative comments are issued. In general trainers as well as VNCPC staff have been able to upgrade their skills - however the level is not yet sufficient to carry out CP assessments as lead auditors and still needs upgrading mainly through on-the-job training completing more audits.
- **In-plant assessments** have been carried out in private, joint venture and SOEs in three sectors distributed in various regions of the country thus complying with the project document. The demanded regional distribution as well as including companies with different ownership forms make a pure demand oriented work more difficult and differs the VNCPC from other NCPCs. This concerns especially the participation of SOEs with limited decision powers and limited market orientation of their managers thus reducing the importance of economic incentives tied to CP measures. Company involvement can be considered as good, with an active involvement (at least to a certain degree) of top management, also reflected in the fact, that top level management at meetings held in companies knew well the CP language. Most companies already implemented some low-hanging fruits in the field of good housekeeping, mostly related to energy use. The impact of these measures is in general modest, due also to low resource prices. A weak point in most factories was that CP teams do not meet on a regular base (internally) and are not integrated into a general management scheme. The sustainability and continuity of CP measures in the enterprise is thus questionable. One of the key features of CP, at least theoretically, namely to make continuous improvements, depends however on continuously reevaluating current business practices and continuously generating new options and ideas. To keep this process alive a more structured approach is essential such as offered e.g. by quality or environmental management systems. The quality especially of the Indian consultants was generally valued highly by the enterprises. Also the VNCPC director did a good job in "indoctrinating" and convincing the companies of the value of CP.
- **Awareness raising and information** activities had a positive impact reflected in a wide dissemination of the CP language used by government officials from various agencies and ministries as well as from research institutes or companies. The message of CP was thus brought over well. However in the context of how to market CP services and assisting other institutions in this respect no concrete activities have been performed till now.
- **Policy advice** is very new, which is normal in a new project which has to build up first its reputation and its internal know-how. Some interesting inputs have been made. To achieve real change however also ministries such as MOI or MFI have to be involved stronger and the policy advice also has to be more concrete. Also concrete instruments have to be designed and

implemented to increase the attractiveness of CP application such as incentives, increased resource prices, pollution taxes or public information disclosure schemes.

#### 4.2. *Effectiveness*

The mission of the CP as described in the Business Plan is to be a focal point for CP in Vietnam and to catalyze the application of CP. This is also in line with the overall objective of the Inception Report. In the Project Document immediate objectives are:

- The establishment of a NCPC capable of performing a catalytic role in building a nation-wide capacity in CP.
- Strengthening of the national capacity for implementing CP techniques and technologies at plant level.
- Creating awareness among key stakeholders of the advantages of CP and supporting them in taking concrete actions towards broader CP application.

After barely 15 months it is too early to measure the accomplishment of these objectives. The achievement of latter needs however clearly the following ingredients:

- Sufficient quantity and capable persons of performing CP assessments.
- Institutional network and allies which perform CP services.
- Active involvement in policy advice to promote CP measures.

In the first part the VNCPC has concentrated to the moment on **training** trainers through a fairly profound CP training combined with CP assessments. The training consists of methodological aspects, aspects relevant for any CP assessment such as energy audit or basic financial tools as well as sector specific issues. The persons trained will have a good basic knowledge, however they do not yet have sufficient on-the-job experience to be qualified CP assessors. They could participate however well in future audits as junior auditors, compared to senior or lead auditors. The program did not incorporate in its training formerly trained CP auditors (e.g. through the HCMC UNIDO Project TF/VIE/97/001). These persons already participated successfully in in-plant demonstrations. They do not yet have the sufficient expertise to be lead auditors so that a deepening of their experience, especially in in-plant assessments would have been important for upgrading the national CP capacity. The project wanted to include them as trainees which was not accepted by these persons, who wanted to be paid for their activities based on fees for national experts. The resistance to participate as trainees is understandable considering that they already took part in former training at a level of national expert. A stronger inclusion of already at least partially trained auditors would however be helpful for creating a stronger CP base. The introduction of CP into the curricula of universities in the field of environment as promoted by the VNCPC (a first workshop was held in March 2000), is a first positive step towards spreading the message of CP in the long-term.

The VNCPC has included among its trainees persons from a wide variety of **institutions**. This creates a certain expansion of CP capacity to potential allies. Currently the VNCPC concentrates mainly on their own agenda and activities and accepts participants from other institutions. In a first phase, when building up your own capacity this is mostly a central element – however it is important to get more outward oriented in the second phase. The gaining of allies and institutional networking implies to foster attempts and first steps of other institutions, even if approaches are not identical to ones made by the VNCPC. A first step could be for example to only accept trainees from institutions if they bring along 1-2 clients which will realize a CP audit. This reduces time dedicated from the VNCPC to select and convince companies, increases the commitment of the trainee, is an evaluation instrument to see if the trainee and the institution is appropriate for CP training and gives the participating institution first references to market thereafter their services. Next to this it improves client orientation of the institutions and the VNCPC takes advantage of these networks. Other potential activities with allies include assistance in building up CP services (e.g. in the promotion of CP, marketing plans), sharing of financial and personnel resources (e.g. according to outputs), organizing CP roundtables etc.

The VNCPC has been actively involved in **policy advice**. The new environmental plan includes CP as a strategic objective (Objective: To Prevent Pollution; includes as one of 4 elements "To apply clean and appropriate technology in production and pollution mitigation."<sup>8</sup>). The National Environmental Action Plan 2001-2005 derived from the national strategy includes programs for preventing pollution. Cleaner Production is listed as a specific program<sup>9</sup> including activities, expected results, monitoring bodies and a general budget to be distributed to areas. The VNCPC and its host are also the core group responsible for presenting an Action Plan for CP. In general it can be concluded that policy outreach, especially considering the short time of the project is good, with a considerable involvement in policy affairs and clear changes towards increasing inclusion of CP in governmental priorities. To strengthen this part a more active involvement with other ministries (especially MOI, MF and MFI) and institutions such as the ADB or other programs (e.g. also such as those supported by UNIDO in this field) would be helpful.

#### 4.3. *Impact*

The impact on the development objective of reducing the environmental pollution in Vietnam cannot be addressed currently as the project is just in its starting phase. As expressed in former chapters, the general framework established is not sufficiently precise concerning the relations between development objective, immediate objectives and goals based on activities to consider the realization of all proposed activities to be a sufficient condition to contribute substantially to the development objective.

The impact on enterprise level is to the moment modest and the continuity of the process of CP (generating new options and ideas) after terminating the assessment in the 15 companies participating in the training program is in many cases improbable (see 4.1.2.).

#### 4.4. *Sustainability*

Sustainability addresses the aspects of technical and financial sustainability providing for a continuous application of CP on a broad base in the country. This does not imply necessarily that the institution VNCPC has to be sustainable, as the concept is promoted and this includes delivering of CP services through different channels.

The issue of technical sustainability is addressed by the training programs (see 4.2.). This includes also the institutional outreach of the program (see 4.2.). The improvement of the framework for applying CP including policy changes to create a higher demand for CP is addressed through the policy activities of the VNCPC (see 4.2.).

**Financial sustainability** is only addressed weakly to the moment. Financial sustainability includes the part of financial sustainability of concrete CP services as well as the financial sustainability of the CPC. For both parts it is important to include other than external finance. Clients of CP services especially enterprises at the moment do not pay for services, although environmental centers charge for related services such as EIA, EMS or other consulting services. With new funding mechanisms being created in HCMC (revolving CP fund established by the city of HCM, additional CP fund for bigger investments in creation by ADB) enterprises also have more interest in CP services so that a service charge is feasible and is already being applied for first clients by the EPC in HCMC. Compared to other NCPCs the Vietnamese center has a low rate of self-finance and national finance. There also exists no clear financial plan how this very low level shall be increased. After terminating external finance the probability is thus high that the VNCPC is integrated in the INEST and services without substantial cost-recovery will be discontinued. In extreme case this might lead to abolishment

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<sup>8</sup> draft National Strategy for Environmental Protection 2001-2010

<sup>9</sup> in total 23 programs are listed

of CP services altogether if the latter has not achieved a market which pays for this service. The continuity of the former VNCPC staff at the host is a non-sufficient condition for financial sustainability of CP services and project staff should be well aware of this fact. This has been shown, e.g., in EP3 projects, situated in private consulting firms which of course continued working after finishing the CP project but without promoting and selling very much CP services but again their traditional services such as EIA, end-of-pipe etc. However, at least at the present stage, it is also feasible that for certain activities new external funds can be claimed thus achieving sustainability of the center without however reducing dependence from external funds.

The **sustainability of the concept** depends basically on creating a sufficient demand for CP services and delivering adequate services through various institutions to cater for this demand. In the first part policy advice and improving the market conditions for applying CP are of basic importance as well as the identification and usage of existing and new marketing channels (e.g. combining CP services with other environmental services such as EMS, EIA or with end-of-pipe services or with other industrial services such as quality management, SME technical advice etc.). The second part depends on sound training and an institutional strategy to upgrade existing institutions and their staff in CP capacity. Currently the CPC is working primarily on the training aspect while the other three elements (policy, marketing, institutional networking) are still in an infant stage.

## 5. Conclusions

1. Basically the planning documents (Inception Report as well as the official Project Document) give a good overview of the current situation, the institutional players in the field and activities to be undertaken. These activities are thereafter outlined fairly detailed for the first phase. The concept of first developing a capacity and thereafter disseminating the results based on the experiences and the built-up capacity is convincing. However the Business Plan for the center lacks a business oriented approach and is not very strong in the identification of different potential clients and their real demand. It also lacks a profound discussion of potential allies and problems in the diffusion of the concept and fails to attend the goal of financial sustainability. In practice however major players and key institutions were identified well by the NCPC. The conclusion thus concerns basically the underlying project documents.
2. The market for CP is still very weak and will probably not grow quickly, especially if CP is sold as a stand-alone service. This is due to low resource prices, no or low discharge or disposal fees and the economic framework which lacks incentives to enterprises to behave profit oriented. The motivation of private firms is mainly on reducing costs which is basically reduced inputs from materials or reduced energy consumption. Other costs are either very low (see above, e.g. companies dispose their sometimes hazardous wastes e.g. on company premises without any treatment) or due to weak financial accounting controls not perceived. Even private middle-sized companies sometimes do not know expenditures on resource inputs such as fuel. Incentives for SOEs are based more on non-financial motivation. Sometimes they act after having been convinced e.g. through the CPC or through DOSTE that CP is something good to do.
3. In accordance with the project document the Government (HUT/INEST) provided adequate air-conditioned office space with furniture and office equipment and laboratory premises to accommodate laboratory equipment. The office space is of very good quality.
4. Apart from the case of delays in delivery of laboratory equipment no other significant problems in managing the project by UNIDO have been reported. Transparency of expenditure allocation and timeliness of delivering financial reports were not always satisfactory.
5. The Director of VNCPC has a dynamic and client-oriented approach with very good capabilities to manage and market the center. He has deep understanding of the mission of the Center as a catalytic agent for cleaner production in the country.
6. In general the benchmarks as formulated in the inception report have been achieved or are surpassed. Compared to other new CP projects, e.g. in Central America or in Colombia, results for the first year are similar, however with a stronger emphasis on training on behalf of the VNCPC.

7. Concerning the quality of the main outputs training is generally appreciated and considered very positively by participants as well as from institutions which send participants. In general trainers as well as VNCPC staff have been able to upgrade their skills - however it still needs upgrading mainly through on-the-job training completing more audits.
8. Most companies already implemented some simple low-hanging fruits in the field of good housekeeping, mostly related to energy use. The impact of these measures is in general modest, due also to low resource prices. A weak point in most factories was that CP teams do not meet on a regular base (internally) and are not integrated into a general management scheme. The sustainability and continuity of CP measures in the enterprise is thus questionable. Management has normally no clear monetary and non-monetary incentive schemes for the continuous development and implementation of new ideas and lacks management systems based, e.g., on TQM or EMS or integrated management approaches.
9. Awareness raising and information activities had a positive impact reflected in a wide dissemination of the CP language used by government officials from various agencies and ministries as well as from research institutes or companies.
10. Currently the VNCPC concentrates on its own agenda and activities. It can be noted that the VNCPC managed to identify well the key institutions involved and to include staff from the latter as trainees. A first and important step in generating strategic alliances has thus been made.
11. In general it can be concluded that policy outreach, especially considering the short time of the project has been good, with a considerable involvement in policy dialog.
12. Financial sustainability of the VNCPC is only addressed weakly to the moment. Clients of CP services especially enterprises at the moment do not pay for services. Compared to other NCPCs the Vietnamese center has a low rate of self-finance and national finance. There also exists no clear financial plan how this very low level shall be increased. The sustainability of the concept depends basically on creating a sufficient demand for CP services and delivering adequate services through various institutions to cater for this demand. In the first part policy advice and improving the market conditions for applying CP are of basic importance as well as the identification and usage of existing and new marketing channels. The second part depends on sound training and an institutional strategy to upgrade existing institutions and their staff in CP capacity. Currently the VNCPC is working primarily on the training aspect while the other three elements are still in an infant stage.

## **6. Recommendations**

### **Deepening the capacity of the VNCPC team**

1. It is important to intensify the capability of the VNCPC staff to conduct in-plant assessments and to really have the capacity to act as trainers, lead auditors or consultants at a similar level as, e.g., the Indian international experts. The VNCPC staff has thus to be involved directly and actively and not only as co-ordinators or "managers" in in-plant assessments to gain the necessary know-how and experience. To support it the VNCPC staff should be trained on conducting measurement and use of the available measuring equipment. Basically the further training in technical aspects should be based on sector-specific training and in-plant assessments. This is a condition to act as multipliers and assist other institutions and their staff on building up the capacity for CP assessments.
2. The VNCPC needs to upgrade its management and marketing capacity. This includes developing also training and assistance to CP assessors in how to introduce management changes, simple management systems and incentive schemes in companies to make CP a sustainable issue at enterprise level. It is recommendable that CP teams include also specialized staff on management and economic issues for this purpose. A pure technical approach will not transform CP into a continuous approach at enterprise level, nor will it facilitate alone the creation as well as implementation of new options.

### **Increased networking in policy and strategic partners for CP services**

3. Extend and upgrade the institutional network developed in Phase I. Help these institutions in devising adequate marketing strategies and in delivering services to their clients. Basically the institutions have to bring clients but the VNCPC can take a more active role in creating strong ties to allies thus using them as multipliers and increasing the CP market. Links should also be built up with related services such as quality management, technology fostering, energy saving and SME promotion. An example how to integrate some very basic and least cost CP promotion at SME level is given by the UNIDO project in HCMC. They distributed the CP reports of the companies to SMEs. Seemingly the one page option sheet was read carefully and more than 50% of the sample tried on their own to apply some of these measures in their enterprise. The development of clear, simple, sector related options for various sectors could thus serve as first instrument to gain interest from SMEs without incurring in major costs. Also the VNCPC could increase the emphasis to work together with local and national partners such as MOI, DOI, NEA, DOSTE, VIZA, VCCI and the State Corporations, which have a direct interest in improving the environmental performance of their member companies. The experience from DOSTE, HCMC provides a good example of how the direct involvement of an institution which is politically powerful towards the companies and which has the means and resources to subsidize cleaner production and can thus strengthen the demand for CP related services.
4. Get more involved in policy dialogue relating also to more actors in this field (e.g. Ministries of Finance, Ministry of Industry, related donor programs). Also upgrade the policy offer made by proposing concrete policy instruments and strategies to increase the market for CP.
5. To support implementation of the above recommendations establish close contacts not only with relevant professional organizations but also with development cooperation projects supporting these organizations. Close cooperation and coordination should be established in particular with projects implemented by UNIDO.
6. Make use of the Advisory Board as a platform to discuss conceptual and strategic issues of cleaner production and as a tool to cultivate support for CP and VNCPC at various levels. VNCPC should play an active role by selecting, formulating and proposing to the Advisory Board specific and topical issues to be reviewed by the Board, suggesting - whenever possible - optional solutions.

#### **Introduce a more business-oriented approach towards CP**

7. In general develop a more business oriented attitude towards CP and the management of the VNCPC reflected in a demand oriented approach, working with clients and allies who have a business interest and have the willingness to pay for services (or who are willing to share costs in the case of allies) and develop more marketing and outreach skills. Improved marketing can include the following aspects:
  - More usage of allies with their own products, services and clients such as e.g. the EPC. CP can be included in their services or be offered as additional service. They already have clients and know their products so the principal function of the VNCPC is to deliver well-trained staff and help them to develop a marketing strategy to include successfully CP in their services. If staff from other institutions wants to participate in training it could also be demanded as condition that they bring along at least one client who is willing thereafter to make the corresponding CP assessment.
  - Link CP services to related ones such as EMS, quality management, energy efficiency, end-of-pipe measures, technology cooperation, reengineering, SME business development services etc. Some services can be added on to the VNCPC products (e.g. energy, technology services) others not (e.g. quality). In both cases it is important to try to sell the concept of CP and spread the know-how on CP to institutions delivering such services. The above mentioned services have already market acceptance and can be sold so that CP can be added on to such services thus improving CP market acceptance and outreach. The VNCPC must clearly demonstrate the value added to such centers of adding CP upon their services and develop the corresponding arguments (such as more value for final client due to economic savings, possibility of access to special funds for CP, more clients etc.). Services not directly

- linked to CP are however a more complex and difficult task and may stretch the VNCPC services too broadly so that a focalization will be needed.
- Include management issues such as management systems, staff incentives (of monetary or non-monetary nature such as recognition awards) and accounting issues in CP assessments to improve acceptance of CP by entrepreneurs, to assure continuity of CP in enterprises and to increase staff commitment and implementation of measures.
  - Offering more diverse services such as quick or rapid appraisals, developing only the most simple CP measures and low-hanging fruits with immediate returns and high probability of implementation used also as bait or marketing instrument to gain customer confidence in the CP product.
8. Develop stronger ties to financial and technology services to upgrade CP from pure good housekeeping and to introduce also more sophisticated clean technology measures. Some finance schemes especially in HCMC already exist for this and the UNEP finance program can also help to build up links to financial institutions and remove barriers existing between credit suppliers and industry. VNCPC should develop the capability (either among its staff or through networking with relevant professional organizations) to assist companies in the preparation of loan application to finance CT options.
  9. Include energy efficiency projects as an important element of CP. In most in-plant assessments already under way energy efficiency measures were discussed, options developed and some of them realized swiftly. The VNCPC has already begun to include this component, reflected in the in-plant assessments made, through the energy expert Dr. Thomas Bürki or the UNEP project proposal on energy efficiency measures which includes the Vietnam VNCPC as one focal point. The VNCPC could however intensify its contacts in this field, e.g., to energy efficiency projects as well as to the climate change office, as GHG emissions are closely related to energy consumption. Such programs can be marketing vehicles for other CP activities (making their clients interested also for other CP measures) and can also increase the attractiveness, especially in economic terms, of CP assessments.
  10. Introduce payment schemes for different services of the center especially for training and in-plant assessments thus assuring a certain quality control, increasing implementation of measures and commitment at company level, improving the financial sustainability of the CPC and the attractiveness of the CP concept to interested institutions and consultants. Payment through services will not cover all expenses. It can however contribute to a significant degree towards financial sustainability of the CPC.

### **General issues**

11. To achieve these changes a shift towards policy, national capacity building through allies and the marketing of CP assessments is proposed. This would include not to repeat in the second phase the extensive modular training realized in the first phase but to concentrate more on upgrading the skills of already trained persons, sector specific training, in-plant assessments, forging working alliances and policy advice.
12. It is recommended to continue with a CTA for the first year in Phase 2 and thereafter shift to a few months/year backstopping through an external expert, preferably the CTA or FHBB. This is based on sound management and good capabilities of the National Director and his staff. More resources could therefore be devoted to sector specific training, upgrading management and marketing skills, and policy advice through specialized international experts and by supporting strategic allies. The current level of equipment is sufficient for the purpose of CP but needs a few additions to have a complete mobile set .
13. Prepare a new Business Plan which focuses on strategic issues such as the more business oriented approach, a clear definition of clients or target groups, services the VNCPC will deliver, the management strategy to achieve the stated goals and upgrading management and marketing skills as well as forging strategic alliances.



## 7. Lessons Learned

1. Orientation on influencing the demand for CP services needs to be pursued from the very beginning of project activities. To facilitate this process the project document should elaborate a strategy which should be continuously confronted with the acquired experience and reviewed accordingly.
2. Qualifications and in-plant experience of the NCPC staff are the most important factors for the NCPC to become a “center of excellence” in conducting CP in-plant assessment. However, NCPC cannot be perceived only as a highly qualified provider of consulting/advisory services to industry. These services need to be complemented by up-front activities to promote application of CP in the country through policy and regulatory measures, education as well as incorporation of CP in other consulting/advisory services. This concept needs to be understood by all major stakeholders.
3. Long duration of a training programme for CP assessors is in itself not a guarantee of success. Training of CP assessors requires a balance between classroom training and on-the-job training, the latter being critical and, therefore, requiring intense attention and ample time to exercise.
4. Profile of the organization hosting an NCPC influences the profile of the NCPC particularly in terms of staff qualifications and outreach to industry. In the case of NCPC hosted by an R&D organization the staff may have very good academic qualifications but it is probable that they would have limited shop-floor experience. In such a case the project design needs to incorporate intensive on-the-job training for the NCPC staff.
5. NCPC needs to have a mobile kit of measuring equipment. Specification of the equipment needs to be done by the NCPC with consideration of availability and quality of local service laboratories. It is preferable to procure the equipment locally, taking into consideration availability of after-sales services. Training of NCPC staff in using the equipment needs to be included in project activities.
6. Managerial issues play an important role in implementing CP in enterprises. Basic issues are the complete and correct disclosure of costs and benefits of CP for the company, preparation of financial proposals from CT options, inclusion of incentive issues when developing the CP approach in the company and inclusion of CP into management systems used by the company (e.g. quality or environmental management schemes) to ensure continuity of the CP process. Such issues should be addressed as explicitly as technical problems and options. CP teams as well as NCPC staff are currently however mainly composed of technical staff and need to be supported with staff with a managerial background.
7. NCPCs need to address more the marketing of its core product: CP. To attract more clients new marketing channels such as upgrading existing quality, technology and environmental services and close work together with enterprises which already have client relations in this field need to be used. If the NCPC relies on attracting all clients on their own without using existing market forces its outreach will be very limited. Other market players with contacts to industrial clients must thus be convinced of the value added to their services by taking along CP as a topping-up of current business services. More efforts need to be dedicated in analyzing such links, their value added for the industrial client as well as for the service provider and what changes are required in the CPC services to attract such allies.

## Annex 1: Terms of Reference

### In-depth evaluation

R: TOR.002 (31 January 2001)

US/VIE/96/063 Vietnam National Cleaner Production Center (VNCPC)

### TERMS OF REFERENCE

#### 1. THE PROJECT

Key data

<b>Executing Agency:</b>	UNIDO in cooperation with UNEP
<b>Implementing Agency:</b>	Institute for Environmental Science and Technology (INEST) of the Hanoi University of Technology, Ministry of Education and Training
<b>Funding Agency:</b>	State Secretariat for Economic Affairs, Bern, Switzerland
<b>Project document signed</b>	22 April 1998
<b>Duration:</b>	5 Years (official starting date 17 November 1998)
<b>Budget:</b>	UNIDO: 2,5 million USD
<b>Vietnamese Government:</b>	in-kind contribution of 2 billion VND
<b>UNIDO expenditures:</b>	637,221 (30 November 1999)
<b>National Project Director:</b>	Prof. Dinh Van Sam, director of INEST
<b>Director of the VNCPC:</b>	Dr. Tran Van Nhan
<b>Chief Technical Advisor:</b>	Prof. Heinz Leuenberger

#### 1.2 Brief description of the project

The following text is extracted from the project brief which has been prepared by the VNCPC based on the project document and the inception report.

#### **Project Objectives and Outputs:**

The objective of the VNCPC is to become the recognized center of excellence in providing technical cleaner production services to industry and to perform a national catalytic and coordination role in promoting cleaner production in Vietnam. This should be achieved through production of the following clusters of outputs:

#### ***Establishment of a Vietnam National Cleaner Production Center***

To establish VNCPC office at the host institute, the Hanoi University of Technology; to hire and to train VNCPC staff members; to set up a CP library; to install the laboratory with necessary equipment and to connect to UNIDO/UNEP WWW information system and CP database.

#### ***In-plant Demonstrations***

To show how the CP concept could work in Vietnam and provide opportunities for hands-on training for industry personnel.

*The VNCPC in-plant demonstration follows the Indian DESIRE method, which has proven to be suitable for SMEs in India (the DESIRE Method is based on the method used in the Dutch PRISMA project). The results of the in-plant demonstration will be documented and disseminated through seminars, case studies and visits to the demonstration factories.*

*Based on the UNIDO/UNEP, WB, US-EPA Cleaner Production manuals and experiences gained in many countries, the VNCPC will develop sector-specific Cleaner Production manuals in Vietnamese language. The VNCPC can initially involve state-owned enterprises (SOEs) and foreign joint ventures (JVs), SMEs and supply chains of factories. In the long run assistance to JVs and larger SOEs should be self-financing.*

**Training**

In the long term, the training component is the most important task of the VNCPC in building CP capacity in Vietnam. VNCPC will build up the human resource base (national experts) for future CP activities.

*In Phase I, training activities will focus on training for trainers including technical staff from the selected industrial sectors and from companies participating in the in-plant demonstration component. The trained trainers will become lecturers/coaches for sectoral training and in-plant demonstration programs in Phase II. Observers (mainly from DOSTEs) will help promote and organize CP activities in the provinces.*

*To make sure that VNCPC will be a center of excellence and will be able to play a coordination role, a priority is also given to building up the CP capacity of staff members.*

*The VNCPC will assist universities in drawing up curricula for Cleaner Production courses. The VNCPC will also cooperate with research institutes and centers in providing new information on CP to help industries in solving specific clean technology issues.*

**Information dissemination and awareness raising**

VNCPC will create awareness on the advantages of CP through a focussed information dissemination strategy, which includes regular contacts with industries, industry associations and corporations, universities, partner institutions and national press.

*Create awareness for CP strategy and information dissemination in the industrial society and in environmental authorities.*

*Provide available information on CP to the users and to support other components in creating CP demand and marketing products of the center.*

*The center will provide the clients (industries, consultants, institutes, industrial associations, universities) with all CP information they need for the implementation of CP-strategy and methodology.*

*Moreover, the VNCPC will be a provider of technical information such as available technologies for solving environmental problems; it will share experience with interested partners through the submission of case studies and will promote the center's activities.*

**Policy assessment and advice**

Policy assessment and advice is an important activity component to achieve sustainability of the CP concept in a country.

*VNCPC will assist key policy-makers in developing an effective policy framework focusing on mechanisms and instruments for promoting the application of Cleaner Production in industrial enterprises.*

*VNCPC will create awareness among key national stakeholders on the advantage of cleaner production and support them in taking action to promote the application of cleaner production in industrial enterprises.*

**Twinning institution:** Basel Institute of Technology (FHBB), Switzerland. The Swiss institution will assist the VNCPC by sharing its experience in promoting CP and by providing specializing expertise to the VNCPC in implementing CP activities. The NCPC is also linked to the Indian NCPC.

**Other cooperation:** The Center is looking for a cooperation with the partners in the UNIDO/UNEP NCPCs Network, the Asia Pacific Roundtable on Cleaner Production, other NCPCs in Asia, the World Bank, the Asian Development Bank, bilateral and multilateral donors, and others.

In Vietnam the partner institutions will be selected from either environmental centers or sectoral research institutions, for example CEETIA, Center for Environmental and Chemical Engineering, CECE, Center for Environmental Protection and Chemical Safety, Research Institute of Pulp and Paper (in the North); CEFINEA, ECO, EPC, TTC (in the South) and Danang EPC (in central part).

## 2 THE IN-DEPTH EVALUATION

### 2.1 Purpose, scope and method

#### 2.1.1 Purpose

The purpose of this mid-term in-depth evaluation is to enable the stakeholders to take decisions on the future orientation of the project. The evaluation is conducted in compliance with UNIDO policy of mandatory evaluation of large technical cooperation projects and preference for mid-term evaluations.

#### 2.1.2 Scope

In-depth evaluation is an activity in the project cycle that attempts to determine as systematically and objectively as possible the relevance, efficiency, effectiveness, impact and sustainability of the project. The evaluation will assess the achievements of the project against its objectives, including an examination of the relevance of the objectives and of the project design. It will also assess to what degree the assumptions/risks as identified in the project document held true/occurred and identify other factors that have facilitated or impeded the achievement of the objectives. While a thorough review of the past is in itself very important, the main emphasis of the evaluation at this early stage in the project cycle will be on coming up recommendations and lessons learned for the future. Specifically the in-depth evaluation will pay attention to the following issues:

##### *Assessment of the overall project design and implementation in terms of:*

Relevance and coherence of objectives, goals and strategies pursued.

Impact and suitability of the activities conducted and the instruments used

Suitability of major local project partners for meeting the objectives of the project.

The sustainability of project activities and results

Internal organization and procedures

Project assumptions and strategies used to exploit upcoming possibilities and prevent pitfalls.

Interaction with other key players in Vietnam.

Interaction and synergies between the different CP services outlined below.

Technical, economic and financial sustainability of the NCPC concerning specific services and the NCPC in general.

Other aspects that affect the implementation of the project.

##### *Assessment of in-plant assessments in terms of:*

Impact and outreach of in-plant assessments

Client satisfaction

Cost benefit analysis of the in-plant assessment

##### *Assessment of training strategy in terms of:*

Integration with in-plant assessments

Impact of training

##### *Assessment of information dissemination strategy in terms of:*

Client orientation

Information quality.

Timeliness of information delivery.

Potential utilization of this service.

##### *Assessment of the policy dialogue strategy in terms of:*

Suitability and level of addressed partners.

Suitability of policy dialogue approach adopted by the NCPC.

Potential acceptance of policy advice among involved institutions and impact on decisions regarding the adaptation and enforcement of policy measures as proposed by the NCPC.

Actions taken by the Government of Viet Nam to include CP methods in its environmental legislation and enforcement

Furthermore the in-depth evaluation will assess whether it is likely that the NCPC will have accomplished the following specific benchmarks at the end of phase 1 (these benchmarks were agreed upon At the TPR meeting on 2 August 1999):

10 in-plant demo-projects.  
Improved laboratory equipment.  
1 train-the-trainers course for 20 trainers (certified CP auditors) and 10 observers.  
10-12 awareness -building seminars.  
3 sector specific CP-training workshops.  
1 workshop on integration of CP to university curriculum.  
3 sector specific awareness raising training workshops.  
2 study tours for policy makers.  
Training of VNCPC staff to become a Center of excellence.  
2-3 discussion forums and 1 seminar for policy makers conducted on CP policy.  
Publishing 1 article in 3-4 state corporation newsletters.  
Publishing 3-4 articles in the VCCI newsletter.  
Publishing 2 articles in Vietnamese newspapers.  
Development of database on industry.  
Development of database on national CP experts.  
Development of database on international experts.  
Translation and publishing key CP Books.  
Conducting study on information demand by industries.  
Set-up a library

Based on the above analysis the in-depth evaluation should come up with a number of recommendations. These recommendations should include, but not be confined to, the following issues:

Recommendations for how coordination arrangements with other activities in the field of CP environment in general and process optimization activities could be strengthened - specifically the potential to cooperate with the two other main UNIDO programs ongoing in the country (SME development and Industrial policy), the UNEP financing project and relevant projects funded by Switzerland should be explored.  
Recommendations for the key issues to be addressed in creating strategic alliances in North, Central and South Vietnam to facilitate a countrywide dissemination of cleaner production in Viet Nam.  
Recommendations for changes in the activities proposed to be conducted in phase 2  
Recommendations for how national ownership and financial sustainability of the NCPC could be improved, e.g., by changes in the institutional set-up.

### **2.1.3 Method**

The evaluation team will:

study project documentation sent by UNIDO Hqs and information available in the field (project document, the Inception Report, project files, relevant material on the NCPC program in general including UNIDO thematic evaluation of the NCPC program, relevant material of TF/VIE/97/001 A Pollution Reduction in HCMC@ including the technical review and published reports;  
interview project staff of VNCPC, the CTA and members of the Advisory Board (primarily in respect of policy activities and future activities of the Center);  
visit and interview target beneficiaries including 1) at least three trainees in the in-plant assessments/training program, 2) at least three companies taking part in the program, 3) two companies who took part in the TF/VIE/97/001 project (to determine longer term sustainability of CP projects);  
visit and interview partner institutions to be selected from either environmental centers or sectoral research institutions, for example CEETIA, Center for Environmental and Chemical Engineering, CECE, Center for Environmental Protection and Chemical Safety, Research Institute of Pulp and Paper (in the North); CEFINEA, ECO, EPC, TTC (in the South) and Danang EPC (in central part);  
visit and interview cooperating institutions such as the Vietnam Chamber of Commerce and Industry, National Environment Agency, DOSTE in selected provinces, and DOSTE and DOI in HCMC;  
visit and consult other technical cooperation projects in this field and related/complementary areas, such as the UNIDO projects for SME development and the Industrial Policy project;  
consult the UNIDO and the UNDP office in Hanoi and the UNDP office in HCMC and some of the other donor agencies supporting CP or environmental programs, such as the Vietnam Canada Environment Program, DANIDA, Sida, World Bank, USAEP.

When visiting companies taking part in the demonstration program the evaluation team will use a standard questionnaire to be prepared on the basis of a draft questionnaire, which will be handed over to the team by the UNIDO Project Manager on the occasion of briefing at the UNIDO Hqs.

Although the mission should feel free to discuss with the authorities concerned all matters relevant to its assignment, it is not authorized to make any commitment on behalf of UNIDO or a donor.

## **2.2 Composition of the evaluation team**

The evaluation team will be composed of the following:

One nominee of the donor with an economic background, experience in business plan development and experience with Cleaner Production; he will act as the team leader

One nominee of the Government with good knowledge of the industry-related institutional and policy framework of the country

One nominee of UNIDO with knowledge of Vietnam and Cleaner Production

These members of the evaluation team should not have been directly involved in the designing or implementation of the program/project.

## **2.3 Report and timetable**

The field mission will be conducted in March/April and will take two weeks. External consultant will be recruited for 3 weeks to cover briefing and debriefing

The evaluation report should follow a standard structure as described in the briefing material of OIO. In order to ensure that the report considers the views of the parties concerned and is properly understood and followed up by them it is required that:

the draft report or the main conclusions and recommendations are presented to and discussed with the development partners and UNIDO in Vietnam;

As the report is the product of an independent team acting in their personal capacities, it is up to that team to make use of the comments made by the parties involved and to reflect them in the final report. However, the evaluation team is responsible for reflecting any factual corrections brought to their attention prior to the finalization of the report.

The final report is to be submitted in full text on a diskette (in WordPerfect or Word) to the Office of Internal Oversight two weeks after the completion of the field mission at the latest.

## Annex 2: Meetings

### Hanoi Part I

Day	Organization/Person/Function	Content
13.3.00	<i>VNCPC (Vietnam National Cleaner Production Center)</i> Tran Van Nhan, Director VNCPC Dinh Van Sam, Director INEST Heinz Leuenberger, CTA UNIDO Urs Herren, Deputy Regional Coordinator SDC Markku Kohonen, Representative UNIDO Liesbeth Paardekooper, Program Officer UNIDO	Briefing, short history VNCPC
13.3.00	<i>HUT (Hanoi University of Technology)</i> Hoang Ba Chu, Vice Rector	Meeting with HUT, discussion of project results
13.3.00	<i>INEST (Institute for Environmental Science and Technology at HUT)</i> Dinh Van Sam, Director	Visit of laboratory
13.3.00	<i>SDC (Swiss Agency for Development and Cooperation)</i> Urs Herren, Deputy Regional Coordinator	Activities of SDC in environmental and related fields; project history and perception
13.3.00	<i>MOET (Ministry of Education and Training)</i> Vu Ngoc Hai, Vice Minister	Perception of the project as chairman of the advisory board

### HCMC

Day	Organization/Person/Function	Content
14.3.00	<i>VNCPC</i>	Participation at training module 5 of the center
14.3.00	<i>DOSTE HCMC (Department of Science, Technology and Environment)</i> Doan Thi Toi, Head of Environmental Management Division	Plans of DOSTE in CP and activities together with center
14.3.00	<i>ERM (Environmental Resources Management)</i> Caroline Cook, Technical Director	Activities of ERM and experiences with environmental consulting
14.3.00	<i>CEFINEA (Institute of Environment and Resources at the National University of HCMC)</i> Lam Minh Triet, Director Truong Thanh Canh, Head of Dep. of Scientific Research	Activities in CP, relation to center
14.3.00	<i>Trainees at Module 5 (2 interview sessions)</i> Pham Duy Khang, Houng Van Thu Paper Mill Le Thin Hien, Bai Bang Paper Company Nguyen Thanh Kung, CEFINEA	Impressions of participants in training
14.3.00	<i>Lecturer and consultant, NCPC India</i> P.K. Gupta, director NCPC India	Impressions of former UNIDO in-plant project in HCMC and relations to CPC, SOE in process of equitization
15.3.00	<i>Linh Xuan Paper Company</i> Nguyen Tri Khuc, vice director	This paper company participated in the former HCMC/UNIDO CP demo project
15.3.00	<i>Vinh Hue Paper Company</i> Nguyen Hoa, director Nguyen Thi Ve Linh, vice director Tran Thanh Phuong, CP team leader	Company is one of 6 demo-projects of NCPC in HCMC, SOE
15.3.00	<i>Saigon Textile Company</i> Duong Trong Nghia, Vice-Director Vo Van Tri, Director of Towel Production Plant Nguyen Quoc Khanh, Deputy Director of Towel	Company is one of 6 demo-projects of NCPC in HCMC, SOE

15.3.00	Production Plant <i>Nhat Tri Manufacturing Firm</i> Nguyen Van Vien, Director	Company is one of 6 demo-projects of NCPC in HCMC, private enterprise
15.3.00	<i>Novartis</i> Andrew Moore, Sector Head	General information on perspectives from the private sector
16.3.00	<i>DOI (Department of Industry)</i> Nguyen Van Lai, Vice Director Ngo Van Hai, Acting Head of Science, Technology and Environment Division (STE) Truong Kim Hoa, staff STE Le Chi Bao, staff STE	Experience with CP and NCPC
16.3.00	<i>EPC (Environmental Protection Center)</i> Tran Minh Chi, acting director	Experience with NCPC
16.3.00	<i>HCMC Environmental Management Project UNDP</i> Jon Ward, technical advisor	Relations to CP and CPC
16.3.00	<i>HCMC University of Technology</i> Vu Ba Minh, lecturer	National expert on CP with UNIDO/SIDA project on CP in HCMC in food processing industry

**Hanoi Part II**

Day	Organization/Person/Function	Content
17.3.00	<i>Team meeting</i>	Discuss first results
17.3.00	<i>NEA (National Environment Agency)</i> Chu Thi Sang, Director Environmental Technology and EIA Division	Participated in study tour CP, policy matters in CP
17.3.00	<i>VCEP (Vietnam Canada Environment Project)</i> Robert R. Everitt, Project Manager	Project also has CP activities and relates to CP
17.3.00	<i>Revision of documents at VNCPC</i>	
18.3.00	<i>INEST (Institute for Environmental Science and Technology at HUT)</i> Dinh Van Sam, Director	Activities in CP, future plans
18.3.00	<i>CEETIA (Center for Environmental Engineering of Towns and Industrial Areas)</i> Pham Ngoc Dang, director	CP related activities
18.3.00	<i>Revision of documents at VNCPC and meetings with NCPC project director and CTA</i>	

**Hai Phong**

20.3.00	<i>DOSTE (Department of Science, Technology and Environment)</i> Nguyen Manh Cuong, Director of Environmental Management Division (EMD) Le Son, Vice Manager of EMD	Discuss relations with CPC, plans and activities in CP in Hai Phon
20.3.00	<i>Hai Long Company Ltd</i> Doan Van Dui, Deputy Director Tran Thi Lan Huong, Manager of Engineering and Quality Control	Private food company participating in the CP demo project
20.3.00	<i>Vinapipe</i> Woo Gon Kim, General Manager of Production and Technical Department Nguyen Tien Tri, Engineer Production Dept., Vice Leader of CP Team	Joint-Venture Vietnam South Korea. Company participating in CP demo project



**Hanoi Part III**

21.3.00	<i>Trung Thu Textile Co. Ltd.</i> Nguyen Huu Thanh, Director	Private textile firm participating in the CP program
21.3.00	<i>UNIDO</i> Markku Kohonen, Representative Liesbeth Paardekooper, Program Officer	Discussion of preliminary results
21.3.00	<i>CECE (Center for Environmental and Chemical Engineering)</i> Dang Xuan Toan, Center Director Nguyen Xuan Sinh, staff	Participation in CP training
21.3.00	<i>Team meeting</i>	Discussion of draft report
22.3.00	<i>VCCI (Vietnam Chamber of Commerce and Industry)</i> Vu Tien Loc, Secretary General, Chairman Committee for SME	Member of the Advisory Board
22.3.00	<i>MOSTE (Ministry of Science, Technology and Environment)</i> Pham Khoi Nguyen, Vice-Minister	Member of the Advisory Board
22.3.00	<i>Royal Danish Embassy/DANIDA</i> Astrid Agerholm Danielsen, First Secretary	Activities of DANIDA, DANCED in environment in Vietnam
22.3.00	<i>IMH (Institute of Meteorology and Hydrology)</i> Tran Duy Binh, Director Le Nguyen Tuong, Chief of Planning and Finance Division Nguyen Mong Cuong, Chief Division of Agrometeorology, Secretary of Project Climate Change Office	CP and GHG, activities in Vietnam
24.3.00	<i>Embassy of Sweden/SIDA</i> Annika Johansson, First Secretary	Activities of SIDA in brown field
24.3.00	<i>SDC</i> Urs Herren, Deputy Regional Coordinator	Discussion of preliminary results
24.3.00	<i>UNDP (United Nations Development Program)</i> Nguyen Ngoc Ly, Unit Head Environment and Natural Resources Management	Activities of UNDP
24.3.00	<i>Team meeting to prepare debriefing</i>	
25.3.00	<i>Debriefing</i> Participants from VNCPC, INEST, HUT, MOET, MPI, UNIDO, SDC, seco, Swiss Embassy	Presentation and discussion of evaluation results

## Literature Used

### Project Documents:

- Project Document
- Inception Report
- Annual Report 1999
- Train the Trainers Program
- Evaluation Reports of Trainer Program Module I, II, III and IV
- Minutes of TPR meetings
- Report on success indicators 1999

Abt Associates and Grütter Jürg (1998): Comparative Analysis of Cleaner Production Centers, performed for seco and US AID

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MOSTE, NEA (2000): National Strategy for Environmental protection 2001-2010, Draft II:03/11/00

MPI and UNDP (1999): A study on aid to the environment sector in Vietnam

UNIDO (1999): In depth evaluation of selected UNIDO activities on development and transfer of technology US/GLO/94/009, Component 1

UNIDO (1999): Reduction of Industrial Pollution in HCMC TF/VIE/97/001, CP case studies

UNIDO (??): From Waste to Profits: How to Improve the Economic and Environmental Performance of Industry in HCMC