



UNEP



**Ministry of Education and Training**  
**Ha Noi University of Technology**  
Institute for Environmental Science and Technology

# Việt Nam

## Cleaner Production Centre

Annual Report 2004



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## FOREWORD



**T**his year marked a new step in the life of the centre as we completed the project VIE/96/063 (1998-2004) and moved into a new phase in our development. Thanks to numerous activities in training, demonstration, policy advice, and information dissemination,

the advantages of cleaner production are now widely known by industries, and government officers. Promoting the application of cleaner production (CP) on a larger scale is however still a challenge due to limited market for commercial consultancy, but I believe that, in a relatively near future, industries will recognize that CP is an effective tool for sustaining their business. To support this evolution, we will expand our service offers and continue to strengthen our cleaner production network, to foster the emergence of a market for cleaner production and its related activities in the next three years.

Welcome on board to our new management members, Asc. Prof. Dr. Ngo Thi Nga, managing director and M.Sc. Vu Tuong Anh, deputy director. Both have been fervent promoters of CP since the inception of the Centre. With them, the development of our Centre is in good hands.

On this occasion, I would like to express our sincere thanks to the donor – SECO –, the executing agency – UNIDO –, ministries, advisory board, host institution and other cooperating institutions for their continuous support, as well as participating companies and individuals who have helped us to achieve our goals and objectives. Special thanks are conveyed to Prof. Heinz Leuenberger, Chief Technical Advisor of the Centre for his great contributions throughout the project. Finally, my thanks also go to all staff members, for their hard and effective work.

We are looking forward to further cooperation with all of you in the future.

*Asc. Prof. Dr. Tran Van Nhan*

*General Director of Viet Nam Cleaner Production Centre*



**L**ooking back at the first period of the Vietnam Cleaner Production Centre (1998-2004), we can be proud of the achieved results. The targets for training, cleaner production assessments and related activities were achieved or surpassed in the most cases.

Our team grew from five members to 17 and all employees from the beginning are still with the centre, an excellent sign of ownership of the project and of its success in the last years. In 2004, we maintained our ISO 9001 and ISO 14001 certificates and were able to get financial supports of Seco/Unido for another three years.

This extension will allow us a better and longer market penetration and it will make sure that CP remains a core activity of the Centre in the long term. It will also allow us to strengthen our planned and systematic CP methodology, as well as to explore new fields and develop new competences and activities, including the supply of more sophisticated and technology oriented services or the broadening of our services towards new fields like corporate social responsibility. All these activities will be designed in order to provide our industrial clients with a comprehensive service package that will help them raise their competitiveness and productivity.

This way, we will gain additional experience and strengthen our position as the leading institution in the promotion, implementation and transfer of cleaner production, cleaner technology and related fields in Vietnam.

During these three years, we also plan to hire and train new staff members and improve our integrated management system in order to continuously provide a growing number of national and international customers with high quality services. Let's join hands for cleaner industries.

*Prof. Dr. Heinz Leuenberger*

*Chief Technical Advisor, Viet Nam Cleaner Production Centre*

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### **Cleaner Production**

*Cleaner Production (CP) is the continuous application of an integrated preventive environmental strategy applied to processes, products and services in order to increase eco-efficiency and reduce risks to humans and the environment.*

*For production processes: cleaner production includes conserving raw materials and energy, eliminating toxic raw materials, and reducing the quantity and toxicity of all emissions and wastes at the source.*

*For products: cleaner production includes the reduction of negative impacts along the life cycle of the product, from raw material extraction to its ultimate disposal.*

*For services: cleaner production is to incorporate environmental concerns into designing and delivering services.*

*Cleaner production requires changing attitudes, exercising responsible environmental management and evaluating technical options.*

*Definition by UNEP*

## POLICY



QTW 00976



ETW 00053

In connection with the implementation of its Integrated Management System following ISO 9001 and ISO 14001, the Viet Nam Cleaner Production Centre has established and maintained the following Policy for Quality and Environment:



*The centre in the first days of its establishment*



*Our Centre was certified to ISO 9001 and 14001 in 2002*



*Integrated systems not only help us, but also industrial enterprises to have better and cleaner working environment*

### Policy for Quality and Environment

*The Viet Nam Cleaner Production Centre is a knowledge-based organisation delivering a wide range of high quality cleaner production solutions that gives added value to industry, consulting companies, research institutions, academia, and governmental organisations.*

*As a national focal point on Cleaner Production, we are committed to continual improvement and prevention of pollution. We will comply with legislation and are committed to the International Declaration on Cleaner Production.*

*We will continuously strive to improve the quality of our solutions and services and to improve the effectiveness of our Integrated Management System.*

### Based on our Policy we have formulated the following principles:

- *All staff have an impact on the quality of our services and on our environmental performance, and are therefore responsible for the work they deliver to internal and external customers;*
- *All staff shall inform the management if they cannot fulfil customer requirements; and*
- *All staff shall seek and share experience to continuously improve our services.*

## VISION AND MISSION



*First CP train-the-trainers programme in 1999*



*Cleaner production is demonstrated to be advantageous in a wide range of industrial sectors, sizes and ownerships of companies*



*Cleaner production achievements in participating companies are disseminated through different media*

The vision of the Viet Nam Cleaner Production Centre is to play a catalytic and coordinating role in promoting Cleaner Production in Viet Nam.

The mission of the Viet Nam Cleaner Production Centre is:

- To train the human resource base in enterprises, industry associations, consulting companies, research institutes, academic institutions, and governmental industrial and environmental management agencies in Cleaner Production methods;
- To carry out Cleaner Production Assessments in industries to demonstrate the advantages of the Cleaner Production approach, and at the same time adapt the internationally developed Cleaner Production approach to Vietnamese conditions;
- To assist policy-makers and make recommendations on how to promote the concept of Cleaner Production in industries and through legislation;
- To promote the concept of Cleaner Production and raise awareness among industries and governmental agencies;
- To assist universities in integrating Cleaner Production into their curricula;
- To co-operate with domestic and international organisations with the aim of supporting the implementation of preventive environmental protection; and
- To serve as a focal point of the UNEP/UNIDO Network of National Cleaner Production Centres.

## ORGANISATION AND FACILITIES



Signing ceremony for the establishment of the centre in 1998

The Viet Nam Cleaner Production Centre was established in 1998 within the framework of the UNIDO/UNEP programme of National Cleaner Production Centres. It is sponsored by the Swiss Government through the State Secretariat for Economic Affairs (SECO) and UNIDO as executing agency. The centre is hosted by Ministry of Education and Training and located at the Institute for Environmental Science and Technology of the Ha Noi University of Technology. The activities of centre are evaluated jointly every two years by representatives of Seco, Unido and the Government of Vietnam.

### Advisory Board

The Centre has an Advisory Board consisting of 12 members at department managing levels of relevant ministries and organizations: MOET, MOI, MONRE, MOF, MPI, HUT, INEST, HCM DONRE, UNIDO and SECO/SDC. The Rector of the Ha Noi University of Technology, Prof. Hoang Ba Chu, is the Chairman of the Board.

### Organisational Structure

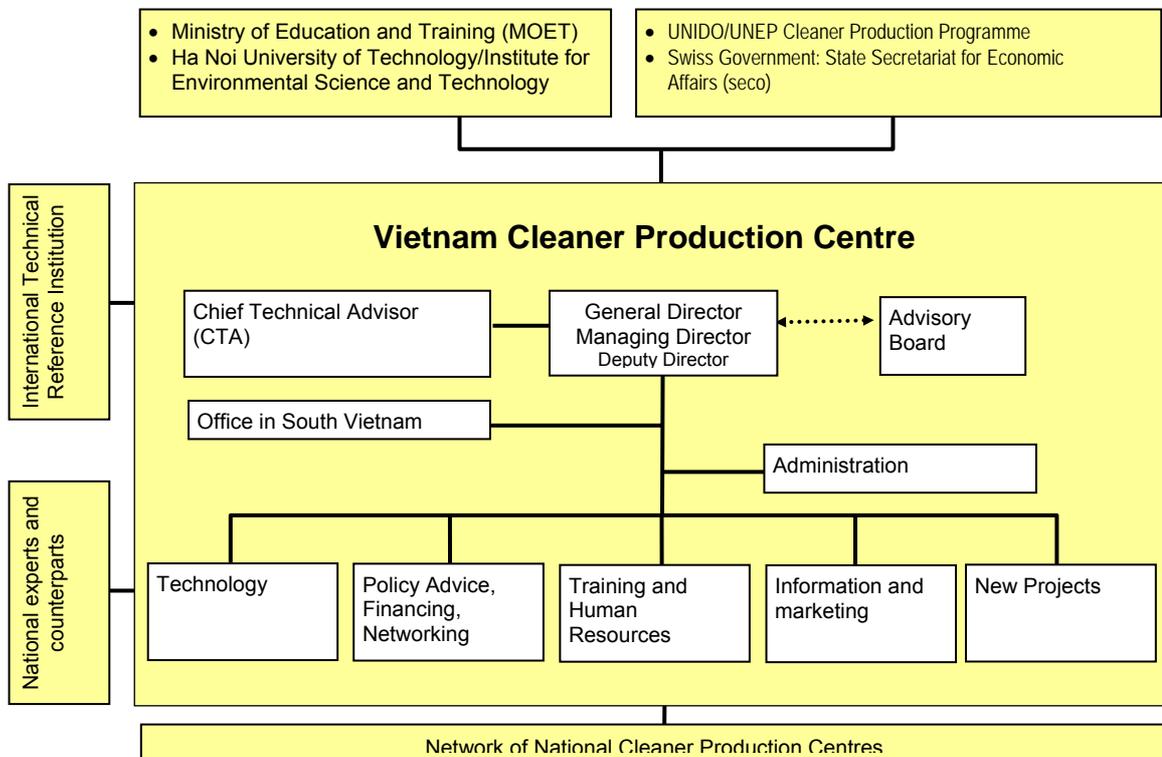


Figure 1. Organisational set-up of the Vietnam Cleaner Production Centre.

## Staff

### Staff of the Centre

Mr. Tran Van Nhan, General Director  
Ms. Ngo Thi Nga, Managing Director  
Ms. Vu Tuong Anh, Deputy Director  
Mr. Do Trong Mui  
Mr. Dinh Manh Thang  
Ms. Tang Thi Hong Loan  
Mr. La Tran Bac  
Ms. Nguyen Le Hang  
Mr. Pham Sinh Thanh  
Mr. Bui Manh Cuong  
Mr. Tran Duc Chung  
Ms. Vu Minh Trang  
Mr. Pham Dinh Phuong (new)  
Ms. Le Thu Ha (new)  
Ms. Vu Thanh Tu, Secretary  
Mr. Pham The Hung, Driver

Mr. Heinz Leuenberger, Chief Technical Advisor  
Mr. Bertrand Collignon, Associate Expert



*VNCPC's staff in front of the new office*

At the end of 2004, the VNCPC team included 14 full time and two part-time employees. Three staff members hold Doctoral, five hold Master, and seven hold Bachelor degrees.

During 2004, staff members of the VNCPC participated in the following training courses:

- Two-week textile technology training in Switzerland (May, two persons);
- Two-week training on cleaner production technology for sustainable development in Malaysia (July, one person);
- One-week CDM training in Thailand (September-October, one person);
- Two-week training on Environmental Management and Cleaner Production in Germany (September-October, one person);
- One-week training on Cleaner Production in Industrial Estates in Germany (November, one person).

Moreover, most of the staff members participated in a one-week Report Writing Skills training organized by the British Council in Ha Noi and staff members were sent to training courses related to environmental improvement in the country on a regular basis.

The management and staff of the Centre have received on-going training through participation in seminars, international workshops and roundtables on cleaner production.

## Counterparts and Networks



*UNIDO plays a significant role in connecting vncpc with international partners*

The Viet Nam Cleaner Production Centre has established long-term cooperation with the Institute of Environmental Technology at FHBB in Switzerland. The Centre has contacts with numerous national and international experts in the fields of environment and cleaner production.

Within the UNIDO/UNEP network, the VNCPC is working closely with the 30 other National Cleaner Production Centres and Programmes worldwide as well as with the participants at the Asia Pacific Roundtable for Cleaner Production. The VNCPC is maintaining a network of CP experts and institutions throughout Viet Nam.

## Facilities



*The laboratory of the host institute is well equipped for environmental measurements and analysis*

The Viet Nam Cleaner Production Centre and its host institution, INEST, have been equipped with portable analytical equipment for both rapid and in-depth assessment of material and energy consumption in various industrial sectors.

The library of the Centre now counts around 600 titles (books and journals) related to environment, cleaner production and environmental management. Additionally, more than 1,000 books and reports are kept in an electronic library.

All staff members have access to Internet through an ADSL connection.

## OVERVIEW OF ACTIVITIES



*Signing ceremony for promotion of new cleaner production services in Vietnam between Unido, Government of Switzerland and Government of Vietnam*

Although no targets were set for 2004 as it was a transition period between two phases of the project, the centre completed a significant number of activities in continuity with its business plan 2001-2003. In December 2004, the Government of Vietnam, Seco and UNIDO signed a project document on the "Promotion of New Cleaner Production Services in Viet Nam through the Viet Nam Cleaner Production Centre", opening a new phase for the Centre. The new project will be executed over the three years 2005-2007. The objectives are to improve the eco-efficiency and the corporate social responsibility of enterprises using instruments such as Cleaner Production (CP), Environmentally Sound Technology (EST) transfers or social services, taking into account supply chain constraints; to undertake the transfer of knowledge needed for this to happen; to pursue the development and expansion of CP and EST markets in Viet Nam.



*Our Chief Technical Advisor was awarded with the medal "for the cause of education"*

The results of the surveillance audits for ISO 9001 and ISO 14001 proved the ability of the Management System to ensure the quality of the work and the environmental performance of the Centre.

With a total of 167 man-months (or around 14 man-years) available in 2004, the Viet Nam Cleaner Production Centre organized 7 training courses totalling 563 person-days of training, 11 seminars (total: 738 person-days), 24 equivalent full cleaner production assessments, and a number of other activities as described below.

# TRAINING

## Types of training courses at the VNCPC:

- **Sector specific training:** this is an intensive training programme organized for representatives of a selected sector and potential service providers/promoters of cleaner production.
- **Special skills training:** The CP trainees from previous intensive training programmes or CP service providers can enrich their skills through these courses.
- **Tailor-made training:** designing and providing CP related training courses on demand.
- **University lecturer training:** providing lecturers information and proactive teaching method on how to integrate cleaner production into their curricula.

The lack of well-trained and experienced cleaner production specialists is one of the main barriers to the implementation of cleaner production in the Vietnamese industry. Therefore, one of the key activities of the centre is to build up, through training, a resource base of national experts on cleaner production.

This year, the centre completed the last in-depth training module of a four-module training programme focused on the metal finishing sector. In addition, a very high number of tailor-made training sessions in cleaner production were held.



*Participants are consultants and researchers...*



*... industry managers and workers...*



*In-class training*



*... local government officers...*



*... and university lecturers.*



*On-the-job training*

*In August 2004, our Chief Technical Adviser was awarded the Medal "For the Cause of Education" by the Ministry of Education and Training for his contribution in cleaner production capacity building. This medal is normally awarded to Vietnamese lecturers, who have contributed at least 30 years of service in the field of education and training. It acknowledges all the work done by the centre and shows the strong support from the University and the Ministry of Education and Training.*

## Sector specific training programmes



CP training in pulp and paper (2001-2002)



CP training in textile (2002)



CP training in metal finishing (2003-2004)

The intensive training programmes, or sector specific trainings, are organized in combination with in-plant demonstration activities so that participants gain practical experience in Cleaner Production Assessments. The total duration of these trainings is 15 days of classroom training and between 11 to 15 days of practical work in companies. The programme is designed as illustrated in table 2. Between each training module, participants and lecturers work together in the company to gain practical experience. At the end of the training, participants are able to carry out cleaner production assessment in industry and work with a team in a company to develop opportunities to increase competitiveness for the company. They are potential service providers or promoters of cleaner production in Viet Nam.

After the last two successful in-depth sector-specific CP training programmes in 2001 and 2002, in 2003 the centre focused its intensive training to support the Metal Fabricating and Finishing Industry. The last training module of the programme ended in February 2004 (54 participant-days). Participants came from the metal fabricating and finishing companies, environmental authorities, consultancy organizations, and research institutes from different parts of the country. By the end of the training programme, the participants are expected to be promoters of cleaner production and able to carry out cleaner production assessments with some limited support from the centre.

Since its establishment, the centre delivered 1868 participant-days of training to 100 certified participants. So far, 20 of them are actively providing consultancy on cleaner production assessments and related subjects

Table 1. Overview of the four-module intensive training programme

Module			
1. CP Methodology 5 days	2. CP Assessment 4 days	3. CP Assessment 3 days	4. CP Completion 3 days
<ul style="list-style-type: none"> <li>Introduction to cleaner production</li> <li>Sector specific processing – general introduction</li> <li>Cleaner production Assessment Methodology</li> <li>Company visit</li> <li>Getting started</li> <li>Electricity efficiency in industry production</li> </ul>	<ul style="list-style-type: none"> <li>Pre-assessment - results and problems</li> <li>Case studies to illustrate methodologies</li> <li>Feasibility of CP options</li> <li>Sector specific processing – environmental concern</li> <li>Implementation of good house-keeping and low-cost options</li> <li>Company visit</li> </ul>	<ul style="list-style-type: none"> <li>Assessment - results and problems</li> <li>Best available technology in the industry</li> <li>Feasibility study of CP options</li> <li>Company visit</li> </ul>	<ul style="list-style-type: none"> <li>Assessment and status for implementation</li> <li>Wastewater treatment in Viet Nam</li> <li>CP Investment proposal</li> <li>EMS, ISO 14001 and CP</li> <li>Certification</li> </ul>

## Special skills Trainings



*Special skills trainings enjoy a high demand from consultants and researchers*

These courses are organized in Viet Nam mainly for the CP service providers and the staff of the centre to improve and to enlarge their own skills in conducting CP assessments. Special skills training courses last three- to five-day and focus on topics like energy efficiency, financial engineering, environmental management system or total quality management in relation with cleaner production.

A one-week training course on report writing skills has been organized for the staff of the centre in June 2004. This is considered as a good starting point to upgrade the skills of the staff members of the centre. An evaluation was made and a follow-up training programme on higher level is planned in 2005.

## Tailor-made Training



*Training local government officers together with selected companies (VCEP programme)*

There was a great demand for tailor-made courses for projects executed by VCEP, UNEP and Danida. The demand of this year focused on the methodology of cleaner production assessment with links to material consumption, energy efficiency, and waste management. Participants were mainly from the industry.

Five training courses were organized with 464 participant-days in 2004, of which two new clients are Da Nang University and US-EPA.



*Boiler efficiency training combined with consultancy in textile companies (US-EPA programme)*



*Cleaner Production training combined with hazardous waste management (Nam Dinh Hazardous Waste Management Project)*

## IN-COMPANY SERVICE

The VNCPC uses three approaches in carrying out its assessments of companies. They are:

- **On-the-job training combined with demonstration:** The centre organizes intensive cleaner production training programmes (4 modules). Selected technical staff of the companies join the training programme and apply CP in their own company with assistance from the centre staff. In-company training is organized for the whole CP team of the company. This is applied to companies in the sector selected as the year's focus sector. After the programme, the technical staffs of participating companies are able to maintain the cleaner production themselves.
- **Semi-consultancy:** The centre also organizes intensive technical trainings for selected staffs of companies and work together with their CP team. During the assessment, the centre staff helps team members to develop cleaner production opportunities and to monitor results.
- **Consultancy:** The staff of the centre works together with cleaner production teams of the companies to develop their options. The staff of the centre carries out necessary measurements and analysis.

The objective of the in-plant demonstration programmes is to show the benefits of cleaner production when implemented in Vietnamese industries. In addition, the in-plant demonstration programmes are used to provide on-the-job training for the participants in our intensive training programmes.

Since 1999, together with the teams from the participating companies, the staff of centre has shown the benefits of cleaner production mainly in companies from the **pulp and paper, textile, metal finishing, construction materials, food processing and beverage** sectors. Companies from other sectors as chemicals, shipbuilding, plastic and plywood products etc. also achieved significant improvement in production efficiency and environmental performance thanks to the support of the VNCPC. The participating companies have their own resources to maintain the programme.

Since 2001, the centre has focused its efforts not only on cleaner production assessments but also on joint cleaner production – energy efficiency assessments. Applying the approach of cleaner production assessment to energy efficiency has given very positive results.

Through its assistance to companies, the centre proves the applicability of the cleaner production method to different types of industries. The potential for savings does not depend on ownership, sector or size of the companies, but on the effort made.

## Results



*Data collection is carried out by staff of the centre, participating companies and external experts*

In 2004, the centre completed 5 assessments programmes for 36 participating companies and 8 follow-ups from assessments of 2003.

**Promoting industrial energy efficiency through a cleaner production / environmental management framework (CP-EE):** This is a regional project with the objectives of reducing industrial carbon dioxide emissions by improving energy management practices and identifying CP-EE investment for industrial enterprises. During the project, the team of the centre carried out energy efficiency audits based on the CP assessment methodology. It helped the participating companies prepare investment proposals for energy efficiency investments and tracked the implementation of feasible EE measures identified. After successful



*Application of cleaner production does not need to be complicated. Providing a tray for chemicals can be an option*



*Replacement of manual surface treatment to semi-automatic lines in Truong Thanh Mechanical Company, Nam Dinh (before & after)*

implementation in 7 companies in 2003, the second phase of the project took place in 2004. Nine companies from the North of Vietnam participated in this phase. They came from the following sectors: construction materials (1), textile (2), food processing (1), beverages (1), ceramics (2), paper (1) and metal finishing (1). Each phase lasts one year. The project is sponsored by UNEP.

#### **Cleaner Production and Occupational Health and Safety Programme (CP-OHS):**

This one-year training combined with a pre-assessment programme was carried out within the framework of Danida's project on Industrial and Urban Development in Viet Tri city. 14 companies from the following sectors participated in the project: chemicals (1), construction materials (2), food processing (2), furniture (1), plastics (1), ceramics (1), ship-building (2), beverage (1), textile (3). Through the pre-assessments, the team proposed high cost investment proposals for 13 participating companies improving production and occupational health and safety conditions. These proposals were accepted by Danida, who financed 40 to 60% of their implementation costs.

#### **Cleaner Production Assessment in Metal Products**

(CP demo): This is a typical on-the-job training combined with CP assessment, allowing both staff members of the participating companies and participants from consultancy organizations to learn and apply the cleaner production methodology. Four metal finishing companies using different technologies participated in this programme. Cleaner production proved to be beneficial in all types of processing: coating, painting, electroplating and galvanizing. This programme started in 2003 and ended in April 2004

#### **Greenhouse Gas Emission Reduction from Industry in Asia and the Pacific (Geriap).**

This three-year programme started in 2002 with the objectives to develop and practically demonstrate a mechanism for encouraging company-level actions to increase the efficiency of energy use in their production processes, thereby reducing associated emissions, especially greenhouse gases. The demonstration sectors are chemicals, iron and steel, lime and cement and pulp and paper. As focal point of the programme in Viet Nam, the centre provided training and consultancy to 4 participating companies. Results from the demonstration will be used to develop training materials in 2005. These activities are sponsored by UNEP/Sida.



Dust extractors were installed in the Jute Company, Nam Dinh

**Cleaner Production Assessments with local authorities** (VCEP II). The Vietnam Canada Environment Programme II is designed to expand environmental capacity from individuals and groups, placing greater emphasis on organizations and institutions. Within this framework, the VNCPC provided on-the-job training to local environmental officials in selected provinces to carry out cleaner production assessments. Five assessments were completed in 2004. Improvement measures are proposed and partly implemented.

The following table shows results reported by participating companies.

*Table 2. Overview of benefits from 15 completed assessments in 2004*

Programmes	implemented /proposed measures	Investment, USD	Annual Savings, USD	Benefits
CP-EE	72/122 (60%)	112,000	172,000	Annual savings of 2,57 GWh in electricity, 93200 m <sup>3</sup> in water, 2970 ton coal, 286 ton DO, 28 ton LPG and 18 ton FO  Reduction of 3,300 ton GHG (CO <sub>2</sub> )
CP-OHS	149/456 (33%)	286,400	717,900	Annual savings of 278,000 m <sup>3</sup> in water, 134 Mwh in electricity, 93 ton coal, 3 ton FO, 5 ton DO, 815 ton CO <sub>2</sub> , 50 tons solid waste, replacement from toluene to water based solvent, improved working conditions
CP demo in metal finishing sector	103/122 (84%)	21,000	277,000	Annual savings of 36 ton chemicals, 1000 Mwh in electricity, 3 ton fuel oil, 58 ton DO, 66 ton LPG, 129,000 m <sup>3</sup> in wastewater, and 1100 ton CO <sub>2</sub>
GERIAP	28/35 (80%)	274,000	294,800	Annual savings of 6,023 ton coal, 3,27 Gwh in electricity, 799 ton DO, 3800 m <sup>3</sup> in water, and 20 ton CO <sub>2</sub>



This can still be seen in some companies nowadays

All these benefits were mainly achieved by reduction at source. Due to the relatively short period of the projects (within one year), the cleaner production potential of the participating companies could not be fully exploited. The above summary shows however that cleaner production could already bring them clear benefits in this short time frame.

It is noted that after the service, most of the companies still maintain cleaner production as part of their daily work, but the information of benefits are not always shared with us. However, we are happy to learn that the CP participating companies, which have stable production, are still maintaining the programme as well as integrating the cleaner production methodology into their decision processes.

## INFORMATION DISSEMINATION AND AWARENESS RAISING

The purpose of these activities is to create awareness of the cleaner production concept among industries, government agencies and universities.

### Public Media



*Three video clips showing Cleaner Production Applications are available in Vietnamese and English*

In 2004, a fourth 30-minute video clip, “Cleaner production in the metal finishing industry” was aired on the National Television channel VTV2 several times. All three previous short movies from Viet Nam Television, (1) Introduction to cleaner production, (2) Cleaner production in textile and (3) Cleaner production in pulp and paper, are available in both Vietnamese and English.

The Voice of Viet Nam aired a 20-minute on-line forum about the application of cleaner production.

Numerous articles were published in newspapers.

In the framework of a European Commission project, the VNCPC together with European partners and the National Cleaner Production Centre of India has developed an on-line information toolbox for the textile industry. The web site is now fully operational at [www.e-textile.org](http://www.e-textile.org), including a Vietnamese version.



*Textile experts are testing the online information toolbox for textile before launching*

### Awareness Raising Seminars



*Achievements in metal finishing sector were shared to other companies by staff of participating companies and experts*

In 2004, ten awareness-raising seminars were organised in different provinces. This year, environmental management accounting was introduced to industries. A number of information roundtables and dissemination seminars were organized to academic and research institutions as well as governmental officials.

513 participants took part in awareness raising seminars in 2004, increasing the total to 1,919 participants for the period 1999-2004.

Beside that, staff actively participated and made presentations in environmental and cleaner production related workshops inside and outside the country.

## POLICY ADVICE



*Signing ceremony of the international declaration on cleaner production by the Government of Vietnam in 1999*



*The VNCPC supported the development of the National Cleaner Production Action Plan, which was discussed during the two National Cleaner Production Roundtables*



*Study tours for policy makers in 1999-2000*

An effective policy framework for cleaner production is essential to promote this concept in industry. Such a framework must involve not only administrative measures as licensing and the enforcement of the laws and guidelines, but also economic instruments such as a duty and tax system for waste disposal and a realistic pricing system for raw materials and energy.

At the Government level, following the signature of the International Declaration on Cleaner Production in 1999 by the Minister of MOSTE and numerous cleaner production study tours for policy makers in 1999-2000, the VNCPC has supported MOSTE/NEA in including cleaner production as a main activity in the Environmental Strategy 2000-2010 and in drafting the National Cleaner Production Action Plan 2000-2005.

The centre played an active role in organizing the first (2002) and second (2004) national cleaner production roundtables in Ha Noi and Ho Chi Minh city. The second national cleaner production roundtable was organized under the auspices of the Ministry of Natural Resources and Environment and the Ministry of Industry. This was the first time in Viet Nam that the two Ministries joined hands to promote this field.



*The Deputy Minister for Industry actively participated in the Second National Cleaner Production Roundtable*

## COOPERATION

Beside its close cooperation with the Swiss partner, FHBB in Switzerland, as well as with UNIDO, UNEP and national cleaner production centres within the network, the Viet Nam Cleaner Production Centre has established and maintained cooperation with and provided services to a wide range of partners.

In particular, the VNCPC started a new cooperation with the ILO, within the framework of the latter's Worker-Management Factory Improvement Programme (WMFIP). The programme started in October 2004 and will last until July 2005. It includes both training and factory-level consulting on working conditions, labour practices, quality, productivity and CP. The ILO and the VNCPC plan to expand their cooperation in further phases of the programme. Other partners are listed in the following table:

*Table 3. The partners*

Partners in Vietnam	Partners abroad
<ul style="list-style-type: none"> <li>▪ MPI-UNEP's Project "Strategy and Mechanism for Promoting Cleaner Production Investment in Developing Countries";</li> <li>▪ MPI-UNDP's "Agenda 21" (Environmental Issues in Investment Planning);</li> <li>▪ Viet Nam Industry Corporations (Viet Nam Textile and Garment Corporation, Pulp and Paper Corporation...) and enterprises;</li> <li>▪ The Ministry of Fisheries' Project "Seafood Quality Improvement Programme" (SEAQIP); and Project "Support to Industry Restructuring &amp; Enterprise Development" (SIREN);</li> <li>▪ MONRE's project "Viet Nam-Canada Environment Project" (VCEP);</li> <li>▪ MOST/NEA-ADB's "Promotion of Cleaner Production Policies and Practices in Vietnam";</li> <li>▪ VCCI/Small and Medium Enterprise Promotion Centre;</li> <li>▪ Viet Tri DONRE's Project "Industrial and Urban Development in Viet Tri City";</li> <li>▪ Nam Dinh DONRE's project "Hazardous Waste Management in Nam Dinh";</li> <li>▪ VEPA, DONREs and DOSTs;</li> <li>▪ Consultancies, Technical universities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ministry of Industry and Handicraft of Lao PDR (Laos);</li> <li>▪ Ministry of Industry (Cambodia)</li> <li>▪ Asian Institute of Technology (Thailand)</li> <li>▪ ASEP - Asian Society for Environmental Protection (Thailand)</li> <li>▪ InWent (Germany);</li> <li>▪ Wuppertal Institute (Germany);</li> <li>▪ BECO (the Netherlands);</li> <li>▪ UNESCO-IHE (the Netherlands);</li> <li>▪ EPA (Environment Protection Agency of the United States of America);</li> <li>▪ Other NCPCs and NCPPs.</li> </ul>

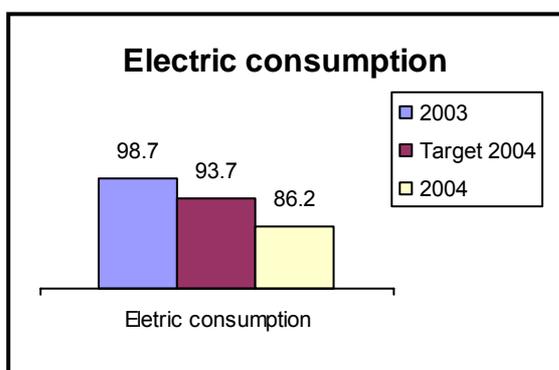
The VNCPC is willing and interested to cooperate with all projects and institutions working in the environmental field to improve the environmental performance of Vietnamese industries through a preventive approach.

## ENVIRONMENTAL PERFORMANCE

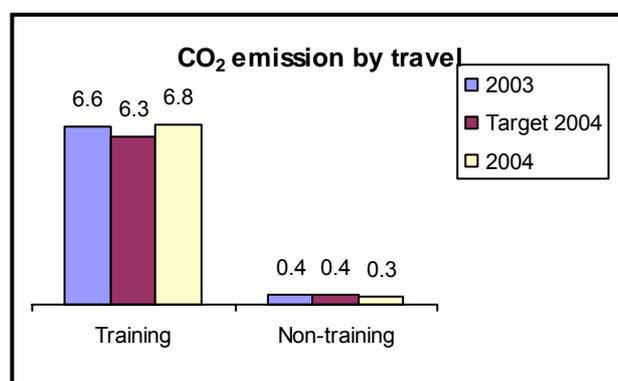
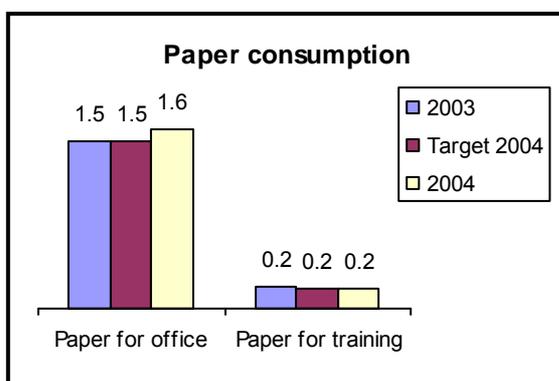
The centre monitors its own environmental performance in two groups of activities: non training and training. The following table shows the environmental performance of the Vietnam Cleaner Production Centre.

Table 4. Overview of environmental targets and achievements in 2004

Area	Aspects	Unit	Monitoring Frequency	Objectives/ Target	Implementation	Note
Office (all activities, but not training)	Paper	kg/ productive man-month	Quarterly	1.48	1.6	Unpredicted high consumption for new project proposals
	Electricity	kwh productive man-month	Monthly	93.7	86.2	OK
	CO <sub>2</sub> emission by travel	ton CO <sub>2</sub> /productive man-month	Quarterly	0.36	0.32	OK
	Waste paper sold	kg/productive man-month	Quarterly	0.64	0.03	We will remove this aspect from monitoring parameters as it does not reflect the recycle ratio
Training	Paper	kg/participant-day training	Quarterly	0.18	0.18	OK
	CO <sub>2</sub> emission by travel	kg CO <sub>2</sub> by participants / person-day training	Quarterly	6.3	6.75	Exceeding



Note: the quantity of productive man-month is calculated as total man-month spent for carrying out projects only.



## OTHER CLEANER PRODUCTION ACTIVITIES IN VIET NAM

In addition to the activities directed by the VNCPC, several other projects that focus on cleaner production or at least have a component on cleaner production have been started or designed in the country during 2004.

The Viet Nam Cleaner Production Centre tries to coordinate all these different activities to create as much synergy as possible. Cleaner Production will only have a significant impact on the industrial development of Viet Nam if it is possible to strengthen and mainstream the different inputs and to build up efficient coordination.

*Table 5. List of coordinated cleaner production projects in Viet Nam in 2004*

Project	Period	Donor	CP content 2004	Counterpart	Location
Urban Development for Viet Tri City	2002-2004	Danida	Cleaner Production investment	DONREs, DOST in Viet Tri	Phu Tho Province
Environmental Pollution Prevention in HCMC (phase III)	2002-2004	UNIDO/SIDA	CP Assessments. Follow-up on earlier project	DONRE in HCMC	HCMC
Industrial Pollution Management. VCEP II	2002-2005	CIDA	CP training and demonstration projects in 4 provinces	VEPA DONREs in Hai Phong, Ha Noi, Bac Ninh, Hai Duong, Da Nang, Long An	Hai Duong, Hai Phong, Bac Ninh, Da Nang
CP-EE	2002-2003	UNEP/GEF	CP-EE training and demonstration	Companies	Whole country
GERIAP	2002-2004	Sweden/UNEP	CP-EE training and reduction of GHG emissions – toolkit development	Companies	Northern Vietnam
Hazardous Waste Management in Nam Dinh	2004-2006	SDC	Cleaner Production Assessments in nine selected companies	DONRE in Nam Dinh and Colenco (Swiss consultant)	Nam Dinh province
Boiler Efficiency for textile industry	2004	US-EPA	Energy efficiency training and consultancy	Companies	Hanoi
Environmental Management Accounting (EMA)	2003-2007	Inwent / Asep	Training	companies, consultants	whole country
Cleaner Production In Binh Dinh Province	2003-2004	DONRE	CP training and consultancy	DONRE	Binh Dinh Province

## LESSONS LEARNED AND OUTLOOK

- New services like technology change management, technology gap assessments will help the centre to attract more companies;
- Implementation and usage of new and cleaner technologies will be crucial issues for the industrial development in Viet Nam. However there is a lack of independent, neutral and well-qualified information centres. The VNCPC can fill this gap;
- Connecting trade promotion with cleaner production will help to attract export oriented clients;
- Cleaner Production and cleaner technology are important aspects of corporate social responsibility. The VNCPC will explore the market in this field and build up its in-house capacities to consult companies in this area in the future;
- The relation with existing cleaner production service providers must be improved. A new voucher system should help to achieve this goal;
- The VNCPC will study the establishment of a green credit line to push the implementation of new and cleaner technologies.

## LIST OF ABBREVIATIONS

ADB	Asian Development Bank
CP	Cleaner Production
CT	Cleaner Technology
Danida	Danish International Development Assistance
DOI	Department of Industry
DONRE	Department of Natural Resource and Environment
DOST	Department of Science and Technology
DPI	Department of Planning and Investment
EMS	Environmental Management System
FHBB	Fachhochschule beider Basel
HCMC	Ho Chi Minh City
HUT	Ha Noi University of Technology
INEST	Institute for Environmental Science and Technology
MOET	Ministry of Education and Training
MOF	Ministry of Finance
MOI	Ministry of Industry
MONRE	Ministry of Natural Resource and Environment
MOST	Ministry of Science and Technology
MOSTE	Ministry of Science, Technology and Environment (now split into MONRE and MOST)
MPI	Ministry of Planning and Investment
NCPCs	National Cleaner Production Centres
NCPPs	National Cleaner Production Programmes
SDC	Swiss Agency for Development and Cooperation
Seco	State Secretariat for Economic Affairs
SIDA	Swedish International Development Cooperation Agency
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
VCEP	Viet Nam - Canada Environment Project
VEPA	VN Environmental Protection Agency
VNCP	Viet Nam Cleaner Production Centre