



Ministry of Education and Training
Hanoi University of Technology
Institute for Environmental Science and Technology

Việt Nam

Cleaner Production Centre

Annual Report 2006



Preface



The establishment and development of the Vietnam Cleaner Production Centre (VNCPC) under the execution of UNIDO has been a significant outcome of international donor support to Vietnam in the last decade. It resulted in true capacity building and promotion of CP to improve productive and environmental performance of the Vietnamese industry. Globalization, changing patterns of consumption and production and increasing environmental concerns are bringing new challenges to industries of the country in their bid to stay competitive in the global market.

In order to reach its goal of supporting industrial sustainable development of Vietnam, in the coming years, VNCPC will focus its activities on the application of CP in the two following areas:

- *The diffusion of quality and productivity enhancing Cleaner Technologies or Environmentally Sound Technologies (ESTs), and*
- *Market access through fulfilling the requirements of the international markets, which is supported by UNIDO's holistic and sectoral CP approach and a combination of CP and related elements (CP and quality, energy efficiency, EMS, health and safety and labour issues, the implementation of Multilateral Environmental Agreements).*

*I would like to take this opportunity to thank SECO, UNIDO, UNEP and the Government of Vietnam, as well as our international and national partners for their continuous support to the success of the centre today - **Mr. Tran Van Nhan, General Director***



One more year has passed so quickly and we are happy to announce that our team is mature in providing services in not only cleaner production, but also many other cleaner production related fields. Through the experience exchange with national and international experts, the team has built up its own capacity, as well as a strong network on which it can rely for specific expertise. The setup of a new office in the South was a daring move of the centre and it proved to be a good one, strengthening its presence in the region. Besides the supports from external experts, our commitment and efforts in maintaining our ISO 9001 and

*ISO 14001 certificates is an important factor for the success of our activities. I want to thank here all our staff members for their hard and effective work. We can be proud to be one of the most successful cleaner production centres. We look forward to an even higher productive year in 2007 - **Ms. Ngo Thi Nga, Managing Director***



Since 1998 the Swiss Government has funded VNCPC to build up capacities in the field of Cleaner Production. VNCPC became a strong organisation in Vietnam in its core function as well as in providing consultancy services for other projects. However, the Swiss funding will end and VNCPC will become a self-financed organisation in mid 2008. The experience in many countries and also the experience gained in Vietnam shows that the CP market is limited and therefore an organisation with the size of VNCPC can hardly be financed only through CP activities.

This means for VNCPC that the project portfolio must be further diversified.

Vietnam will still be an attractive country for ODA money in the next ten years due to many success stories. The ODA money, however, will focus more and more on projects and not anymore on institutional set-ups. Therefore, strong and reliable organizations with good infrastructure will be the preferred implementing agencies for international projects. This should be one of the most important incomes for VNCPC. Besides ODA projects, more and more international companies present in Vietnam need consultant services in the field of legal compliance, occupational health and safety issues, site contaminations as well as waste management. The Kyoto Protocol with its flexible mechanisms such as the Clean Development Mechanism will also be a great chance for securing the future of the Centre. VNCPC has already become a strong partner as a CDM project developer: CDM offers a chance to be involved in technology transfer project combined with financial schemes. VNCPC will play the role of a facilitator between companies, technology suppliers, financing institutions and governmental institutions. Herewith, VNCPC is going to fulfil the core objectives of the UNIDO project.

During my first year as a part-time technical advisor I learnt that VNCPC has an excellent reputation within industries and Governmental organizations, good technical and managerial know-how and brilliant experts. This organizational strengths together with the big requests for VNCPC services as well as the promising Vietnamese market is a good starting point for the next VNCPC phase -
Mr. Daniel Wunderlin, Technical Advisor



The centre has maintained a high level of activity throughout the year. Beside the usual training and consultancy activities as well as the continuous follow-up of companies who took part in previous programmes, the centre has implemented and developed a high number of projects in energy, technology, financial engineering, social responsibility, maintenance, and product designing. The year 2006 was a big step of preparation for 2007 and we are confident that the next year report will bring you a good surprise. We are ready for the success of 2007-
Ms. Vu Tuong Anh, Deputy Director

Our Policy

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



TW 02/00976 QA



TW 02/00053 EM

Policy for Quality and Environment

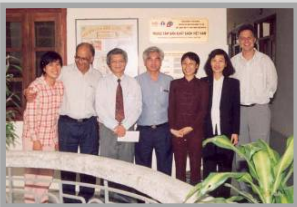
The Vietnam Cleaner Production Centre is a knowledge-based organisation delivering a wide range of high quality cleaner production solutions that give added value to industry, consulting companies, research institutions, academia, and governmental organisations.

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.



Our Vision and Mission

The vision of the Vietnam Cleaner Production Centre is to play a catalytic and coordinating role in promoting sustainable industrial development in Vietnam through the application of Cleaner Production and related techniques.

The mission of the Vietnam Cleaner Production Centre is:

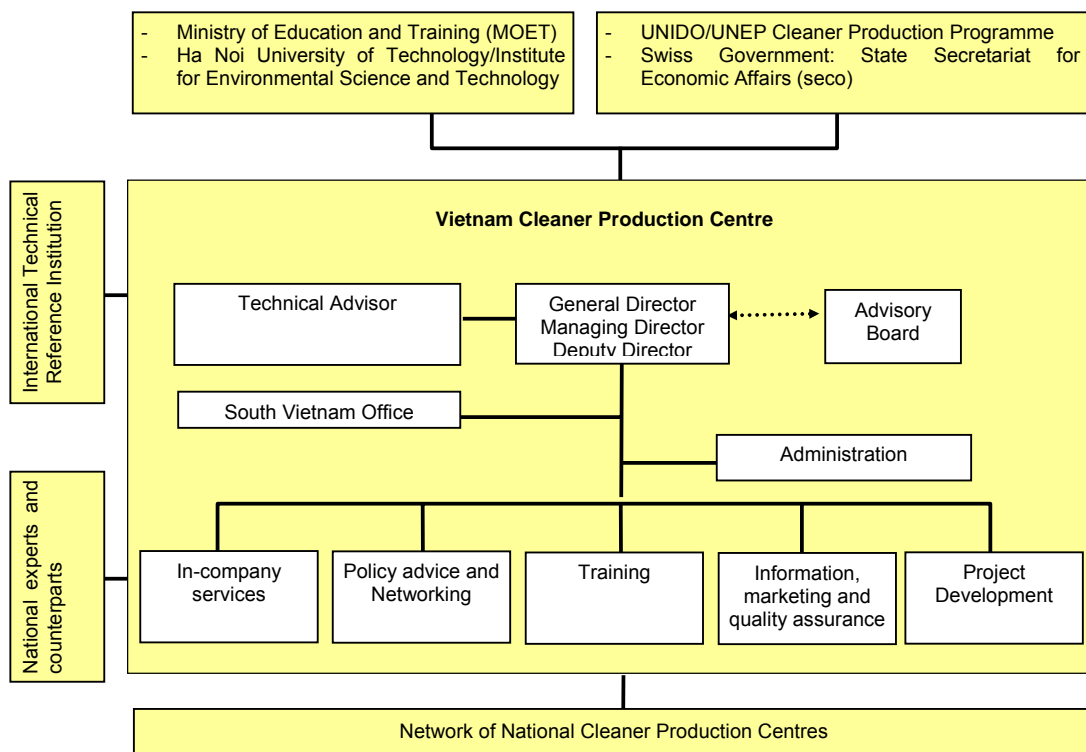
- To train the human resource base in enterprises, industry associations, consulting companies, research institutes, academic institutions, and governmental industrial and environmental management agencies in sustainable development approaches;
- To carry out Cleaner Production Assessments in industries to demonstrate the advantages of the Cleaner Production approach, and at the same time adapt the internationally developed approaches to Vietnamese conditions;
- To promote application of advanced preventive approaches, including cleaner technology transfer and social responsibility;
- 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 as well as other sustainable industrial development tools 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 organizations 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.



Our Organisation

The Vietnam 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 the 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 the centre are evaluated jointly every two years by representatives of seco, UNIDO and the Government of Vietnam.

Organisational Structure



Organizational set-up of the Vietnam Cleaner Production Centre

Board of Management

The Management of the Centre are experienced and professional staff of the host institute (INEST). The General Director, also the Director of INEST, is in charge of the centre's future development and activities on policy advice and networking. The Managing Director coordinates daily activities and provides directions in the fields of training and information. The Deputy Director is in charge of managing and implementing in-company services and development of new projects. Our Chief Representative in the South Vietnam Office implements and reports activities in the South to the Management of Hanoi Office.

Staff

In 2006, VNCP team included 21 full time and three part-time employees. Three staff members hold Doctoral degrees; eight hold Masters degree, and 12 Bachelors. Tasks are assigned to each staff according to the needs of projects, not to the function division.

Staff of the Centre by the end 2006

(Please check our website for update)



Management

Mr. Tran Van Nhan, General Director
Ms. Ngo Thi Nga, Managing Director
Ms. Vu Tuong Anh, Deputy Director
Mr. Nguyen Dang Anh Thi, Chief Representative

Administration

Ms. Vu Thanh Huyen, Secretary
Ms. Nguyen Thuy Lien, Interpreter
Mr. Le Hong Hai, Driver
Mr. Vu Ha, IT Specialist
Ms. Tran Thi Hang, Accountant

International

Mr. Daniel Wunderlin, Technical advisor
Mr. Bertrand Collignon, UNV Specialist

Technical Consultants

Mr. Dinh Manh Thang, Cleaner production – Energy Efficiency Consultant
Mr. Nguyen Hong Long, Cleaner production – Cleaner Technology Consultant
Mr. Tran Tien Dung, National Project Coordinator of Factory Improvement Program
Ms. Tang Thi Hong Loan, Head of Information and Quality Assurance
Mr. Le Thanh Tung, Cleaner Production – Clean Development Mechanism Consultant
Ms. Nguyen Le Hang, Head of Training, Cleaner Production – Social Responsibility Consultant
Mr. Le Xuan Thinh, Cleaner Production – Waste Management Consultant
Mr. La Tran Bac, Cleaner Production – Financial Engineering Consultant
Ms. Vu Minh Trang, Project staff
Ms. Le Thu Ha, Secretariat of 7th APRSCP
Ms. Nguyen Hoang Ai Phuong, Project Staff
Ms. Dang Nguyen Nhung, Secretariat of 7th APRSCP
Ms. Tran Nguyen Ngoc Diem, Project Officer of South Vietnam Office

Advisory Board

The Advisory Board of the Center consists 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. The board members meet once a year.

South Vietnam Office

The office has been set up in June 2006 as planned. This office has main responsibility in marketing and networking. The office is located in the premises of the Department of Science and Technology of Ho Chi Minh city and is co-managed by the Institute for Environmental Science and Technology and the Energy Conservation Centre.

Counterparts and Networks

The Vietnam Cleaner Production Centre has established long-term cooperation with the University of Applied Life Sciences, Nordwestschweiz in Switzerland (FHNW). 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 35 other National Cleaner Production Centres and Programmes worldwide as well as with the participants at the Asia Pacific Roundtable for Sustainable Consumption and Production. The centre is a member of the Asian Society for Environmental Protection. VNCPC is maintaining a network of CP experts and institutions throughout Vietnam.



Facilities



With the advantage of locating in the Hanoi University of Technology, the centre has close relations with professional departments and experts, who are serving the industries.



The Vietnam Cleaner Production Centre and its host institution, Institute for Environmental Science and Technology (INEST), are equipped with portable analytical equipment for both rapid and in-depth assessment of material and energy consumption in various industrial sectors. The portable equipment includes instruments to measure and analyze the boiler efficiency, range of temperature, lighting, motor efficiency, wastewater quality...



Facility for training (room and equipment) are available at good conditions. The host institute has a standard training room for 30 participants. Sectoral databases have been set up together with electronic library.



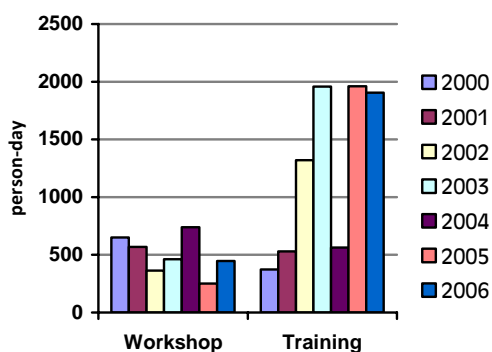
The centre provides favourable working conditions to all staff members. Besides the office with good quality facilities and internet access, the staff members receive supports on mobile phone charge to ensure the sufficient communication.

Overview of activities

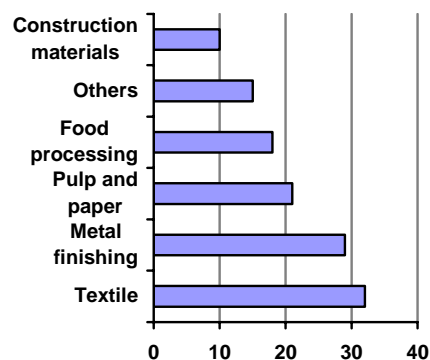
The year 2006 witnessed a full preparation for new services of the centre. Along with traditional cleaner production services, training materials, consultancy skills of cleaner production related fields have been developed. The centre is now ready to start with high quality services in technology assessment, technology transfer, waste management, financial engineering, social responsibility, the clean development mechanism (CDM)...

Since 2002, the centre has received and maintained its ISO 9001 and ISO 14001 certificates. The management of the centre is demonstrating strong commitment to ensure the effectiveness of the integrated management system in order to secure high quality services for a cleaner environment. Since its establishment, the centre has achieved the key results as follows:

Awareness, training and dissemination



Conculty services per sector



Annual savings achieved from our cleaner production consultancy

Sector	Electricity Mwh	Coal, ton	Fuel Oil, ton	Diesel oil, ton	Gas, ton	Water, m3	Chemical, tấn	Annual savings, USD	Investment, USD
Textile	6,768	1,565	6,510	0	0	1,012,972	496	1,983,367	506,149
Metal finishing	766	220	107	21	37	148,823	77	420,550	114,246
Pulp and paper	44,338	24,541	1,858	0	0	2,906,570	1,228	3,204,208	710,750
Food processing	274	209	48	0,2	0	59,693	60	632,832	150,916
Others	1,498	4,732	29	0	0,2	1,115,477	22	333,721	358,894
Construction materials	3,588	1,922	0	285	8	2,064,314	2,677	893,909	593,669
Total	57,232	33,189	8,551	306	45	7,307,849	4,561	7,468,587	2,434,623

Note: Others stands for rubber, chemical, ship building, wood processing sector.

Our activities and achievements during 2006 will be presented in five main key areas: training, in-company projects, information dissemination, policy advice and new and on-going project development.

Training

The lack of well-trained and experienced cleaner production specialists is one of the main barriers to the promotion 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. The following table presents an overview of the training courses held by the centre in 2006:

Overview of training 2006

Type of training	No of trainings	No. of participants	Participant days
CP integrated topics	8	295	892
CP methodology	7	225	765
Technology	2	41	184
CP in university curriculum	1	16	64

Integrated training in CP and related topics

The application of cleaner production doesn't follow a single approach anymore. Following the integration of cleaner production with energy efficiency and occupational health and safety in 2005, additional topics have been integrated in a number of specific trainings related to cleaner production. They are: Quality Control (QC), Environmental Management Accounting (EMA), and Clean Development Mechanism (CDM). While the QC training provided participants with knowledge and experience in product and production management, EMA is a tool for better investment decision. Techniques and analysis tools for the development of CDM proposals were provided during the CDM training. Participants in the above trainings were service providers and industry representatives. The follow-up with trainees showed that the service providers start applying the knowledge in their daily business with or without the support of the centre.

It is clear that cleaner production is a win-win-win approach – a better solution for enterprises, local authority and communities.

Training in Cleaner Production Methodology

These trainings aim at introducing the cleaner production methodology to the participants in details in order to enable them to apply it by themselves. This requires extensive training, and a modular system of four to seven three-day training sessions has proved to be the most effective. The training in CP methodology combines theoretical knowledge and practice.

In 2006, in-depth CP methodology trainings were organized in Lao PDR and in Cambodia. The training programmes were divided into four modular training courses, following the flow of a cleaner production assessment.

The centre also introduced a voucher system in order to motivate existing Vietnamese cleaner production trainees and consultants to provide and share practical experiences and strengthen the existing network.

Training in Technology

The installation and replacement of new and cleaner technology is encouraged by the Government, as clearly specified in the new Law on Technology Transfer, which was approved on 29 November 2006 and will enter into force on 1 July 2007. However, there is a still insufficient evaluation and comparison skill on how cleaner a chosen technology is.

Two trainings, called Sustainable Assessment of Technology (SAT) and Metal Finishing Technology were organized in order to build up the capacity in this field. While SAT provides a methodology for evaluating the sustainability of various technologies, the latter training focused more on one specific sector with concrete examples. The training targeted service providers and related industry representatives. After the trainings, three metal finishing companies are participating in technology gap assessment programme (see more in Technology Gap Assessment).

Integration of cleaner production into curricula

Targeting the education of young generation in cleaner production through the university curricula, the centre has designed a special programme to equip participating lecturers with the materials and teaching methodology necessary to integrate this topic in their existing curricula.

The introduction of cleaner production into university curricula was organized for universities in the south of Vietnam in 2006. So far, the following universities have introducing cleaner production as a 2-3 credit subjects: University of Technology and University of Natural Sciences (from Vietnam National University of Technology Ho Chi Minh city), Ho Chi Minh city University of Technology, Van Lang University, Can Tho University, Hue University, Nha Trang University, Hai Phong University, Thai Nguyen University, Da Nang University, Hanoi University of Technology, University of Civil Engineering, Hanoi University of Science. The National Economics University is also integrating cleaner production into their existing topic on environmental economics.



Training Plan 2007:

Training on Cleaner Production in Metal Finishing

The prime objective of this unique course is to provide decision makers and supervisors with the required knowledge, latest technologies and operating techniques to avoid the problems and make changes that will be both environmentally sound and economically advantageous.

Tentative: April 2007 (Hanoi)

Training on Environmental Management Accounting

These training courses provide a analysis tool for better decision making for investment in environmental project. The training mainly designed for industrial enterprises.

Tentative: May 2007 (Hanoi), July 2007 (Nha Trang), and September 2007 (Quang Binh)

Training on Technology Change Management

Participants will learn the importance of change management and how to handle the change in organization effectively. In-company training and consultancy will be provided for industrial participating companies, who is dealing or going to deal with technology change. Training is designed for service providers/consultants and participating companies.

Tentative: October-December 2007 (Hanoi) and January to April 2008 (in-company)

Training on Technology Gap Assessment in Brewery

The training will provide information of best available technology and analysis tools to compare with existing ones, in order to make decision in technology investment. This is the opportunity for updating the state-of-the-art technologies and sharing experience between international experts and Vietnamese breweries and consultancy.

Tentative: June 2007 (Hanoi and Ho Chi Minh city)

Training on industrial maintenance

Several trainings on industrial maintenance are planned in 2007. An initial training session will introduce basic maintenance principles and techniques to VNCPC staff and national experts and service providers. A further training session will introduce more advanced topics to the same target group and training modules for industry representatives.

Tentative: July 2007 (Basic training), October 2007 (Advanced training + training module for industry representatives)

A number of training sessions have been planned within the framework of in-company-service projects. Please contact us for details.

In-company projects

Cleaner production application has been proved to be applicable in Vietnam in every industrial sector, independently from the size or ownership of the participating enterprises. The implementation of Cleaner Production is expanding with the integration of many other related topics as energy efficiency, technology, waste management...

In 2006, the centre has carried out consultancy and follow-up in the following projects:

Hazardous Waste Management for Nam Dinh city



Cleaner Production is one of the components of this programme during which, it was introduced as a useful tool in improving the efficiency of material uses, including chemicals. In this programme, the centre provided consultancy for the identification and implementation of improved methods and techniques in participating companies. The cleaner production programme was divided into two phases involving 9 companies in 2004 and 24 companies and households in 2005. Monitoring and follow-up was carried out in 2006.

With a total investment of 820,000 USD for cleaner production options, participating companies managed to save 620,000 USD annually through the following yearly material consumption reductions: 485 Mwh of electricity, 1,800 tons of coal, 9,000 liters of fuel oil, 470 liters of diesel oil, 1,900 liters of LPG, 84,000m³ of water, and 658 tons of chemicals. The yearly CO₂ reduction from lower fuel consumption is equivalent to 3,700 tons.

The programme was sponsored by SDC and managed by Nam Dinh DoNRE and Colenco Power Engineering Ltd

The project team is very enthusiastic and helpful. This project brought about improvement through using material, water and energy more efficiently and creating a cleaner environment - Ms. Do Thi Ly, Director of Manh Chi Paper Company

The successful achievements of this project in our company should be multiplied in many other companies - Mr. Pham Van Mien, Director, Bach Dang JS. Company (Roofing product)

During the programme, the project team helped our company to answer the "burden questions", analyzed the factors related to our production and products. We wish to work with them more in the future - Mr. Nguyen Van Giang, Supervisor at Xuan Thuy Brewery

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



Started in 2002 with the objective 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, this project was completed in June 2006.

The demonstration sectors were chemicals, iron and steel, lime and cement and pulp and paper. Being the focal point of the programme in Vietnam, the centre provided training and consultancy to four participating companies. Results from the demonstration were finalized to develop training materials and published under the website www.energyefficiencyasia.org. In 2006, the website was launched with energy efficiency tools and case studies from participating countries. The information and tools included in the website are also compiled in the publication "Energy Efficiency Guide for Industry in Asia".

The four participating companies in Vietnam are Viet Tri Paper Company, Sai Son Cement Company, Hanoi Ceramic Tile Company and Ha Bac Fertilizer Company. With a total investment of 400,000 USD, these companies gained annual savings of 570,000 USD from reducing their consumption by 4,800Mwh of electricity, 7,500 ton of coal, 280,000 liter of DO, and 252,000 m³ of water. The reduction of energy consumption leads to reductions of 18,000 tons of CO₂. These activities were sponsored by UNEP/Sida.

The work done by VNCPC was of a good quality, also when compared with the other eight countries that participated in the GERIAP project. The VNCPC is well-developed with experienced staff and established methodologies. For this reason we believe that the potential for VNCPC could be even bigger and make your organization even more a leader in this field in Asia. VNCPC did a very good job and it was pleasure to work with the VNCPC team - Ms. Sophie Punte, GERIAP Project Coordinator.

Clean Development Mechanism (CDM) for Industrial Sector

The centre participated in the Austrian project "Support for the development and uptake of CDM projects in the industrial sector". In addition to the capacity building provided by international experts and the development of a network of CDM partners, the centre's staff gained significant knowledge and experience in this field through the development of 5 Project Idea Notes (PIN) and 1 Project Design Document (PDD). The centre will continue activities in CDM in 2007 (see on-going and new development). This project is funded by UNIDO.

Cleaner Production in Textile

This project was carried out in Ho Chi Minh city in cooperation with Vietnam Textile and Garment Corporation at two participating companies – Dong A Textile Company and Dong Phuong Textile Company. Technical staff of the companies received in class training and applied CP into their daily business with support of the centre. This project was implemented in nine months and completed in June 2006.

Both participating companies were satisfied with the service and achievements of this project and provided 9/10 points for evaluation.

*The cleaner production project in Dong Phuong Textile Company helped us shorten the bleaching-dyeing process and reduce the chemical and dyestuff consumption ratios – **Pham Tan Dung, Head of R&D, ex-head of technical section during project.***

*All options proposed by the centre and Prof. Phong helped us save the chemicals, dyestuff and energy. Besides, this project also changes the attitude toward saving manner for our company – **Nguyen Thai Son – Deputy Director of Dyeing Plant in Dong A Textile Company.***

Cleaner Production in Van Chang Craft Village

This is the first cleaner production programme for a craft village in Vietnam. The programme took place in Van Chang, a metal finishing village at household scale in Nam Dinh province. It consisted of 11 CP training sessions reaching over 350 households and CP demonstration in three selected households of the village.

Best achievements are the recycling of 50% of Cr⁺⁶ (a highly toxic chemical) from an aluminium pots production household, the reduction of 90% powder loss in powder coating production, and the reduction of sulphuric acid in a steel extruding process by 30%. Thanks to these improvements, the households' yearly profits increased up to 30%. This project is funded by SDC, Switzerland.

This project received the highest evaluation points from Project Management Unit – 10/10. Average participant's evaluation of training workshop delivered by VNCPC staff was 9.7/10.



Information Dissemination and Awareness Raising



The purpose of these activities is to share the achievements and experiences of our activities with industries, consultancy, government agencies and universities so that we can join hands toward sustainable industrial development.



Our website is the major medium for this purpose (www.vncpc.org). News and events about the centre's activities and actions in the fields related to cleaner production in Vietnam are updated monthly.



In the framework of GERIAP, the centre has worked together with UNEP in developing a website on energy efficiency, which includes information on methodology and sector case studies (www.energyefficiencyasia.org). Information is also available in Vietnamese.



In order to promote the intergration of cleaner production and energy efficiency, business cases were developed for three companies from the textile, metal finishing and paper sectors. The business cases are available in hard copy and on the website.



The centre had its own booths at the "Vietnam International Exhibition Fair on Environmental Technology 2006" that took place from 14 to 18 April in Hanoi and at the workshop of Agenda 21 Project Office. Along with the objectives of sharing information, a number of service orders were made at the first exhibition.

Seven introductory and dissemination seminars were organized in 2006 for 175 participants. Beside self-organized seminars, VNCPC staff members participated and made presentations in a number of environmental and cleaner production related workshops inside and outside the country.

Policy Advice

An effective policy framework for cleaner production is essential to promote this concept in industry. The framework must involve not only administrative measures such as licensing and the enforcing 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.

The third national roundtable on cleaner production was carried out in October 2006 with 100 participants from government, industry, academy and consultancy national-wide. During the roundtable, participants did not only exchange knowledge and experiences, but also provided significant inputs to the development of the cleaner production action plan 2006-2010. The roundtable was co-organized by VNCPC, the Ministry of Natural Resources and Environment (MONRE) and the Ministry of Industry (MOI).

Under request of Vietnam Environment Protection Agency (VEPA) and MOI, the centre provided inputs for development of cleaner production action plan 2006-2010 and cleaner production strategy. These documents are still at preparation phase.

Together with MONRE, the centre is actively preparing the coming 7th Asia Pacific Roundtable for Sustainable Consumption and Production, which will take place in the period of 25-27 April 2007 in Hanoi, Vietnam.

Key Vietnamese legal documents supporting CP application

National Strategy on Environmental Protection to 2010 and orientation to 2020, 2003

Socio-economic Development Plan for the period of 2001-2010, 2004

Resolution No 41-NQ/TW "On environmental protection in the period of industrialization and modernization enhancement", 2004

Revised Law on Environmental Protection, 2005

Law on Technology Transfer, 2006

Industrial Development Policy and Strategy to 2010

Key actions by the Government of Vietnam for the promotion of CP

Montreal protocols on substances that deplete the ozone layer, ratified in January 1994

Vienna Convention for the protection of ozone layer, ratified in April 1994

International Cleaner Production Declaration signed in September 1999

Basel Convention on the control of transboundary movement of hazardous waste and their disposal, ratified in March 1995

Stockholm convention on human health and environmental protection from persistent organic pollutants (POPs), ratified in July 2002

On-going and new developments

In 2007, the centre has started and continues with the following activities. Please contact us for updates:

CP Support to Laos and Cambodia

Recognising the knowledge base and vast experience in CP implementation acquired by the Vietnam Cleaner Production Centre (VNCPC) during its 8 years of operation, UNIDO has retained VNCPC as the lead organisation to assist in capacity building to the Lao Cleaner Production Programme (LCPP) and Cambodia Cleaner Production Programme (CCPP). VNCPC professionals have been involved in various activities right from the inception of LCPP and CCPP, therefore, serving as reliable resource for up-to-date information and knowledge. By working closely with CP programmes and Chief Technical advisor and with its particular advantage of regional cultural and industrial base similarities, VNCPC helps to formulate CP programmes relevant to the region. This South-South co-operation has proved to be extremely effective in CP promotion and development in Lao PDR and Cambodia.

Cleaner Production Assessments were carried out and completed at eight textile-garment companies in 2005-2006. Another eight food processing companies will complete their cleaner production assessments in 2007. A new batch is under selection process.

Success of LCPP & CCPP would not have been possible without the partnership and support of VNCPC. I would like to thank VNCPC management and experts for delivering efficient, effective and relevant services to the CP programmes of Lao and Cambodia - Permod Gupta, Chief Technical Advisor of Cleaner production Programmes in Lao and Cambodia.

Cleaner Production and Environmental Management System

“Cleaner Production in Industry” is one of five components in the Vietnam – Denmark “Development Cooperation in Environment” Programme (DCE) for the period 2006-2010. Under this component, the Vietnam Cleaner Production Centre provides consultancy in cleaner production application and setting up a simple environmental management system for participating companies in four targeted provinces – Phu Tho, Thai Nguyen, Nghe An and Quang Nam. It is expected that 10 companies will be selected in 2007.

Resource Augmentation by tapping renewable resources and utilizing wastes

Started in 2006, the overall objective of this project is to promote the eco-town concept to close the loop as locally as possible in the Vietnam Sugar Sector. The project has three major components: awareness raising, design of environmentally sound technologies (EST) for the demonstration projects and the implementation of a demonstration sugar company with rainwater harvesting, wastewater treatment

and reuse, and production of compost and biomass from municipal organic waste. Binh Dinh Sugar Company was selected to demonstrate this project. However, after the designing phase, the company underwent a big change in management board and could not continue the project. The selection process for a new demonstration company is in progress.

The project is sponsored by UNEP/International Environmental Technology Centre and is expected to be completed by September 2007.

Financial Engineering

Through VNCPC, the Swiss Embassy is in the process of introducing a Green Credit Trust Fund (GCTF) in Vietnam to support cleaner production / cleaner technology investments. The GCTF increases the attractiveness of Environmental Sound Technology (EST) investments by reducing the demand on collateral and through a partial reimbursement of the capital invested based upon the environmental improvement resulting from the investment. GCTF targets investments in EST of Vietnamese industrial enterprises (over 75% national capital), of small and medium size (with maximum 500 employees or no more than 5 million USD assets). The credit may range from 10,000 USD to 1,000,000 USD. VNCPC will evaluate the environmental aspects before and after the investment. Under the foreseen scheme, the enterprise will receive a reimbursement of 25% of the credit if the pollution reduction reaches 50% after the investment, and a reimbursement of 15% if the reduction reaches 30%. The local banks selected by VNCPC are Techcombank, Asia Commercial Bank and Vietnam International Bank.

Technology Gap Assessment and Implementation

An assessment was carried out in Xuan Hoa company in order to explore a potential investment in a new Cr-Ni electroplating line. Feasibility study has been carried out by a Swiss electroplating expert in 2006. Another three metal finishing companies are under assessment process. More will come in 2007.

While the technology gap assessment technically compares the existing technology with the best available technology, the technology assessment and implementation focuses on the most relevant technology from a feasibility point of view. Technology-related activities can be linked with the Green Credit Trust Fund.

Social Responsibility

Together with the Directorate for Standards and Quality (STAMEQ), the centre has sent one staff member to represent the Vietnamese Industry Stakeholder Group at the ISO Working Group Meetings on Social Responsibility. This Working Group aims at developing the ISO 26000 standard, an International Guidance Standard on SR applicable to all types of organizations that is expected to be published in 2009. More information is available at www.iso.org/wgsr.

After the completion of its pilot Factory Improvement Programme (FIP) in July 2005 and in light of the significant contribution provided by the VNCPC, the International Labour Organization (ILO) has selected the centre to lead the program in the North of Vietnam in the period of December 2006 to October 2007. The programme includes training and factory-level consulting on labour and technical aspects as workplace cooperation, quality, productivity, cleaner production, human resources, occupational health and safety and workplace relation. 11 companies from printing, garment and metal pre-fabricated sectors are participating in the programme.

Clean Development Mechanism (CDM)

From the experience gained in CDM thanks to the above-mentioned UNIDO project in 2006, the centre has built its own resource to develop ready to sell potential PINs and PDDs for CDM. Initial screening has been carried out and the centre's objective is to carry the most promising projects through the national and international approval process in 2007 and 2008.

Industrial Maintenance

One significant factor in the inefficient use of energy, water and other resources in the Vietnamese industry is the improper maintenance of the productive equipment. With the support of the Wallonie-Bruxelles region of Belgium, VNCPC will implement a 1½-year project to integrate industrial maintenance in its offer of services. The project will start at the beginning of 2007 and include five missions from a Belgian expert in Vietnam, two study tours for VNCPC staffs in Belgium as well as pilot projects in two to three Vietnamese companies to demonstrate the benefits of the implementation of industrial maintenance. The Wallonie-Bruxelles region also committed to support a similar project for "Integrated water management in the textile industry" in 2008-2009.

Design for Sustainability

VNCPC proposed in September 2006 a project for funding under the EU Asia Invest programme. The project, called "Cleaner Production for Better Products" (CP4BP), aims at increasing the capacity of selected industries in Vietnam, Cambodia and Lao PDR to develop innovative products adapted to the requirements of the European market, in particular in the environmental and social fields, through the application of product-related Cleaner Production (CP) approaches. It has been designed in partnership with AIT Centre in Vietnam, UNEP DTIE (France) and the Technical University of Delft (Netherlands) and will include capacity building as well as the implementation of sustainable product design in three Vietnamese companies. It has been approved by the European Commission in the beginning of 2007 and is expected to start during the second half of the year.

Lessons learned and Outlook

Vietnam joined the WTO in 2006. This represents a challenge for the Vietnamese industry in its bid to ensure its competitiveness. The competitiveness is not only affected by the cost and quality of the products, but also by the behaviour of the industry on social responsibility and environmental issues. Looking back at the development of cleaner production application, this approach proves to be an effective tool for industry.

The recent issuance of new Laws on Environmental Protection as well as the review of existing legislative documentations related development planning, wastewater fee, electricity price... show the great concern of the Vietnamese Government for Environmental Protection and sustainable industrial development. Cleaner production is an essential tool as it can help industry to comply with legislation not only at the lowest cost, but in most cases with economic savings on the short and on the long term. Once the know-how is transferred, the participated industry can continue the application by themselves.

Cleaner Production is not just a question of cleaner technology, but the transfer of cleaner technology can be a critical one when the industry has achieved all low-hanging fruit. The implementation of cleaner technology is often hindered by objective or perceived financial barriers. The introduction of the Green Credit Trust Fund will be a good support to boost enterprises' willingness in looking at more environmentally friendly solutions.

So far, cleaner production has been introduced to industry from a production process perspective, ranging from material substitution to equipment modification, technology change, reuse and recycle. The application of cleaner production to products and services should also be explored as it presents even higher economic and environmental potentials.

The consultancy quality of national experts is however still a concern. Networking and experience sharing is thus essential at this stage when the demand of industry is increasing.

Let's join hands for a greener industry.

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List of Abbreviations

APRSCP	Asia Pacific Roundtable for Sustainable Consumption and Production
ASEP	Asian Society for Environmental Protection
CCPP	Cambodia Cleaner Production Programme
CDM	Clean Development Mechanism
CP	Cleaner Production
DO	Diesel Oil
DONRE	Department of Natural Resources and Environment
DOST	Department of Science and Technology
EMA	Environmental Management Accounting
EMS	Environmental Management System
FHNW	Fachhochschule Nordwestschweiz (University of Applied Sciences in North-western Switzerland)
FIP	Factory Improvement Program
FO	Fuel Oil
EMS	Environmental Management System
EST	Environmental Sound Technology
GERIAP	Greenhouse Gas Emission Reduction from Industry in Asia and the Pacific
GHG	Green House Gas
GCTF	Green Credit Trust Fund
HCMC	Ho Chi Minh City
HUT	Ha Noi University of Technology
ILO	International Labour Organisation
INEST	Institute for Environmental Science and Technology
ISO	International Organization for Standardization
LCPP	Lao Cleaner Production Programme
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
MPI	Ministry of Planning and Investment
PDD	Project Design Document
PIN	Project Idea Note
SDC	Swiss Agency for Development and Cooperation
seco	State Secretariat for Economic Affairs
SR	Social Responsibility
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
VCCI	Vietnam Chamber of Commerce and Industry
VEPA	Vietnam Environment Protection Agency
VNCPC	Vietnam Cleaner Production Centre
WTO	World Trade Organization