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DONRE  
HCMC



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# FINAL REPORT

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## Abbreviations

CP	Cleaner Production
DONRE	Department of Natural Resources and Environment
DOST	Department of Science and Technology
EE	Energy Efficiency
NCPC	National Cleaner Production Centre
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
VNCPC	Vietnam Cleaner Production Centre

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## 1 Activities planned

*Table 1: Activities planned as in the progress report*

No.	Activities	Target group	Timeline	Progress
1.	Assistance for monitoring and measurement for demo and CPC units	Consultants	February	combined in the mission on 4 July 2004
2.	Training programme for management level	Companies' management level	February	Conducted on 12 April 2004 and 01 July 2004
3.	Monitoring and analysis of CP implementation in company	Demo companies	April	Conducted on 4 July 2004
4.	Training on CP-EE and experience exchange	Companies	half day in April	Conducted on 13 -14 April and 02 - 03 July 2004
5.	Final result achieved	Project partners	May 2004	no request from international expert
6.	Interactive training	Companies	May 2004	cancelled by DONRE
7.	Final workshop	Project partners	September 2004	no information
8.	Provide CP information	-ditto-	as per special requests, if any	CP information can be accessed via the website: <a href="http://www.un.org.vn/vncpc">www.un.org.vn/vncpc</a>

## 2 Activities completed

### 2.1 Training for management level

4 half-day trainings on "CP concept and benefits" were conducted during two days of 12 April and 01 July 2004. Participants were representatives from management level of companies. Sectors participating in these trainings are shown in Table 1. Besides, relevant staff of DONRE and DOST showed their interests and actively took part in the trainings.

*Table 2: Participating sectors to management-level training*

No.	Date/Time	Sectors
1.	Morning, 12 April	Textile-dyeing, tanning, pulp and paper, Plastic, Rubber
2.	Afternoon, 12 April	Food processing, Seafood processing, Construction
3.	Morning, 12 April	Food processing, aluminium production, paints, cement, tanning, electroplating, fertilizer and chemicals, pulp and paper, textile-dyeing, plastic packaging materials, battery, rubber (these companies are state-owned enterprises and located in industrial parks)
4.	Afternoon, 12 April	Non-state-owned enterprises.

In the first session of the training, Dr. P. K. Gupta from NCPC India, who is the project's international expert, introduced the CP concept. There was also an interesting discussion on concepts of wastes between participants and resources people. The last session was led by Prof. T. V. Nhan from VNCPC. The CP benefits were delivered and illustrated by a number of international and Vietnamese cases. Besides, the barriers to the CP implementation in companies were discussed. Prof. Nhan summarized lessons learned from CP practices. Participants expressed their opinions on the topic showing their awareness of the importance of CP in industries.

## 2.2 Training for technical staff

The training aimed at equipping companies' technical staff with CP methodology and cases of CP implementation from history. Energy Efficiency was also among core topics of the training. Resource people are Dr. P.K. Gupta, ME. D. T. Mui (VNCPC). Table 2 shows participating sectors in 3 two-day technical trainings.

**Table 3: Participating sectors to management-level training**

No.	Date/Time	Sectors
1.	13 - 14 April	Food processing, Seafood processing, Construction, Tobacco
2.	15 - 16 April	Textile-dyeing, Tanning, Pulp and Paper, Plastic, Rubber
3.	02 - 03 July	Food processing, aluminium production, paints, cement, tanning, electroplating, fertilizer and chemicals, pulp and paper, textile-dyeing, plastic packaging materials, battery, rubber

The contents of the training are as follows:

- Brief introduction to objectives and benefits of CP implementation in companies.
- Lessons learned from CP practices in Vietnam, India and other countries.
- CP methodology supported by case studies.
- Energy Efficiency with energy balance calculation.
- Examples and exercises on energy conservation for equipment and recirculation of exhausted heat flows (group work).

CP implementation, especially on EE, drew high attention of participants because of the increase in fuel price since June 2004.

## **2.3 Monitoring and analysis in company**

Experts spent a day working at 4 factories of Minh Dat company which manufactures and reprocesses paper.

The company is characterized by obsolete equipment, mostly imported from China. There is only 1 factory out of the 4 ones that uses fuel oil boiler, while the others operate with coal boilers.

Poor isolation and improper design of steam network was still witnessed. Steam pipe was made longer than enough, causing significant heat loss. Condensate recovery system is in place. However, condensate is not fully recovered and reused. Considerable volume of discharged condensate costs the company a lot.

Analysing the causes of waste streams, experts have generated a number of CP and EE options and instructed the company on how to implement them.

## **2.4 Assistance to the project's CP policy inputs**

Dr. Nhan assisted DONRE in introducing national experts in policy for CP, as well as participated in several workshops on CP policy organized by the project in Ho Chi Minh City.

# **3 Conclusions and Recommendations**

## **3.1 Conclusions**

In the framework of the project TF/VIE/00/005, the Vietnam Cleaner Production Centre has actively involved in the organization of training courses on CP and EE. In this field of work, the following courses were held:

- 1 Energy Efficiency audit course from 13 to 14 January 2003;
- 1 Cleaner Production course from 25 - 27 November 2003;
- 4 half-day courses on CP introduction on 12 April and 01 July 2004 targeting to companies' management level; and
- 3 two-day courses on CP-EE techniques during 13-16 April and 02 - 03 July 2004 supporting technicians

Most of participants paid high attention to resource savings, especially energy efficiency issue.

As requested by DONRE and international experts, VNCPC made active contribution to follow-up assistance to old companies and new ones. In the framework of the activity, two-day work meeting at each company was held and valuable experiences of experts had been shared with companies. VNCPC also provided equipment for conducting energy audit at companies. Potential material and energy savings were noticed in participating companies.

Some findings were stated as follows:

- Some of participants of technical courses were not technicians, which resulted in less efficiency of the training;
- Some technicians of companies could not attend the training fully because their working schedule at company overlapped with the training time. Therefore, they did not apprehend a systematic methodology of CP assessment. This would reduce the efficiency of CP implementation in their companies;
- Staff of external organizations who are supposed to be the CP implementation assistants to companies, could not provide their support effectively due to limited cooperation between both sides;
- The effectiveness of CP implementation was affected partly by the companies' internal complicated administrative procedures.

### 3.2 Recommendations

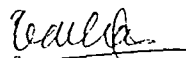
- To increase the efficiency of training courses, target group of participants shall be defined and the organizer shall ensure strict participant selection.
- In case of the demonstration activities, strong commitment of companies' highest managerial level shall be considered as the base of the program and obtained at the first.
- Beside, companies' management need to work out suitable timetables for those core staff who participate in CP training program so that they can attend the whole course.
- DONRE shall strengthen its catalytic role to push up CP implementation in companies.
- External supporters who come mostly from local authorities shall be selected carefully. They shall be required to commit to the project.
- Incentive mechanism can be considered to make CP program more appealing to both companies and external supporters.

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Date: 30/3/2005

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Date: 30/3/2005