

SOME ACHIEVEMENTS IN CLEANER PRODUCTION IMPLEMENTATION IN HO CHI MINH CITY- VIETNAM

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Vietnam in general, Ho Chi Minh city (HCMC) in particular, is in the process of industrialization and modernization. Industrial development was really thrived after having renovation policy in 1986. Two most important changes were to change direction to the market in production and to appear the foreign investment (1987). The city has contributed about 30% to the national industrial production. It is really seen that in over 15 years of fast industrial development, along with the achievements of economic growth, industrial pollution is one of the great challenges that the city has to confront and resolve, especially in the condition of the technology and equipment level of many branches of industries is still backward compared to the regional countries and in the world. Beyond the above dealing the industrial pollution problem in HCMC was also more seriously with the enterprises being in urban regions because of the fast urbanization and the inadequate collection of the wastes. These will menace the sustainable economical development of the city.

Based on the result of an investigation in 2002, there were 28,573 production enterprises (including industry and small & medium or home-based enterprises –SME) in which 2,996 make pollution (10.49%) including 1,625 make serious pollution and have to relocate (5.69%) and 1,371 make pollution and have to treat in place (4.8%). Furthermore HCMC has also 14 Industrial Zones (IZ) in which 9 IZ developed mainly in light industries such as textile and garment, leather and shoes, paper, electronic households, tanning, electroplating and food processing. 1 IZ reserved for heavy industry and 4 IZ for both light and heavy industries.

Among them there are only 4 IZ having the central waste water treatment plants.

The minimization and treatment of industrial pollution have passed the different stages and methods of approach:

- 1) Before 1994, the minimization and treatment of industrial pollution were not concerned from both sides of enterprises and administration agency. The main measure applied was “dilution”. It resulted in the present environmental pollution especially the pollution of canals.
- 2) After 1994, the Environment Law issued, the minimization and treatment of industrial pollution were concerned with the method “end-of-pipe treatment”. However this approach revealed the limits, it transformed the waste from this form to other, increased the production cost, and it was a big investment – non-profit – no payback time.
- 3) The new approach was to reduce the wastes at sources. It was more and more meaningful in the condition of the cost of raw materials, energy was increasing and the environment fee is now developed.

The problem is therefore to choose the best and most efficient solutions to reduce the pollution and raise the production yield. In the last years, the reality in HCMC proved that Cleaner Production (CP) is the best solution for them to reduce pollution, economize the raw materials and energy, raise the production yield and decrease the burden of investment and cost of end of pipe treatment.

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Table 1: CP programs and projects implemented in HCMC

CP Program/Project	Period of implementation	Results/Outcomes			
		Demonstration	Capacity building	Number of participants in training courses	In-plant implementation
1. UNIDO (Phase II)	1997-2000	6	8		
2. AU.EPA	2001	1			
3. Kitakyushu -JICA	1999-2001	2			
4. US.EPA				40	
5. DOSTE & VNCPC	1999-2002			1,200	50
6. UNDP	1999-2001			200	
7. UNEP	2001			140	
8. IPMF & RF	2000 -2003				46

Table 2: Economic benefits of implemented CP options implemented in project TF/VIE/97/001

COMPANY	Total number of CP options	FINANCIAL ANALYSIS		
		Investment, USD	Savings per year, USD	Payback Period
THIEN HUONG	24	62,000	633,700	< 2 months
VISSAN	09	10,000	28,000	< 5 months
XUAN DUC	21	15,000	96,000	< 2 months
LINH XUAN	19	50,000	100,000	6 months
PHUOC LONG	19	4,400	40,000	< 2 months
THUAN THIEN	14	100,000	75,000	> 1.5 year
Total	106	241,400	972,700	< 4 months

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Based on these results, the city's government has directed to develop the industrial and SME production pollution minimization program and the financial mechanism to support the enterprises in broad application the CP methodologies via two funds:

- 1) The Industrial pollution Minimization Fund;
- 2) Revolving Fund loaned from ADB

The Industrial Pollution Minimization Fund (IPMF) belongs to Industrial Pollution Minimization Program established by People's Committee of HCMC. IPMF was founded with its initial fund being one million USD from the City's budget. The Fund will receive additional financial support from State budget and from the city's budget based on its performance and the decision by competent agencies. In addition, it may also receive other financial support based on the agreements by People's Committee of HCMC at the interest rate of 0% per year for the period of 5 years with the grace period of 1 year.

The Revolving Fund (RF) is a part of sub-project on "Industrial pollution Control and Institutional capacity Strengthening" of the Project on "Environment Improvement in HCMC" established in 2001 by People's Committee of HCMC and the credit agreement signed between Vietnamese Government and ADB. The financial source of RF consists of a loan in VND (equivalent to US\$ 2.5 million) funded by ADB at the interest rate of 4% per year for the period of 15 years with the grace period of 6 years.

Based on the results of the Demo projects and the supports of two above funds, there

were 46 enterprises participating the Cleaner Production –Industrial Pollution Minimization - Program of HCMC. They are classified as follows:

- Paper and paper products: 8
- Textile and dyeing: 6
- Food processing: 23
- Chemicals & Plastic: 3
- Rubber processing: 5
- Mechanic: 1

Financial analysis showed that 61% of CP options are low cost (under 1,000 USD), 27% and 12% of CP options are respectively medium and high cost. Environment impact of them to reduce pollution load is 19% high, 26% medium and 55% low.

Cleaner Production with Vietnam, HCMC in particular, is the indispensable access in the process of development and integration. It is new, active and positive in environment protection and brings about the direct benefits for both enterprises and community. However the number of enterprises participating and implementing the CP projects is still small compared to over 30,000 enterprises. Hence establishing the CP policy and supporting funds with the budget from many sources to promote the enterprises apply CP methodology in production are the essential components for sustained development. Furthermore, the successful implementation of CP projects depends imperatively much upon the cooperation and coordination among the relating sides: enterprises, administration agencies and consulting institution (domestic and international).

Table 4: Environmental impact of implemented CP measures

INDICATORS	THIEN HUONG Instant Noodle Company			VISSAN Slaughter house		
	Before CP	After CP	Difference	Before CP	After CP	Difference
1. Fresh water consumption,	12.7 m ³ /T	5.3 m ³ /T	- 58%	1,200m ³ /day	950m ³ /day	- 20%
2. Furnace oil consumption	165 L/T	138	-16%	750 kg/day	702kg/day	- 6%
3. Shortening oil, kg/T	185	160	- 13%	-	-	-
4. Electricity consumption,	-	-	-	17,600 kWh/day	14,628 kWh/day	- 17%
5. COD load, kg/T	8.3	5.6	- 32%	3.34 T/day	2.30 T/day	-33%
6. BOD load, kg/T	3.5	2.2	- 37%	-	-	-
6. Greenhouse Gases	0.51 T/T	0.42 T/T	- 17%	4.47 T/day	3.60T/day	- 19%
7. Solid waste, T/day	-	-	-	15.8	11.72	- 27%
	XUAN DUC Paper company			LINH XUAN Paper Company		
1. Fresh water consumption, m ³ /T	130	85	- 33%	250	140	- 44%
2. F.O consumption, L/T	320	250	- 21%	518	390	- 33%
3. Electricity consumption, kWh/T	740	662	- 10%	1,400	1,140	- 18%
4. Rosin consumption, kg/T	10.8	8.8	- 20%	-	-	-
5. Bleaching consumption, L/T	-	-	-	340	208	-39%
6. Greenhouse Gases, T/T	1.32	0.9	- 20%	2.65	1.86	-30%
	PHUOC LONG Textile company			THUAN THIEN Bleaching & Dyeing Company		
1. Fresh water consumption, m ³ /T	320	240	- 25%	104	70	- 33%
2. Furnace oil consumption, L/T	1,220	1,090	- 10%	1,590	435	- 62%
3. Auxiliary chemicals, kg (total)	391	330	- 15%	56 kg/T	49 kg/T	- 14%
4. Dyestuff, kg/T	6.2	4.3	- 30%	-	-	-
5. Pollution load	-	-	-	-	-	-
6. Greenhouse Gases, T/T	3.8	3.3	- 13%	5.67	2.09	- 63%