GREENING SMALL AND MEDIUM-SIZED ENTERPRISES
Evaluating Environmental Policy in Viet Nam

Promotor:

Prof.dr.ir. A.P.J. Mol	Hoogleraar Milieubeleid, Wageningen Universiteit

Promotiecommissie:

Prof.dr. B.J.M. Arts	Wageningen Universiteit
Prof.dr.ir G. Lettinga	Wageningen Universiteit
Prof.dr. H. Bruyninckx	Catholic University Leuven, Belgium
Dr. Nguyen Trung Viet	Van Lang University, Vietnam

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Le Van Khoa

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Preface

At the moment small and medium-sized enterprises (SMEs) are an important group of enterprises in Viet Nam. It is estimated that more than 90% of all private Vietnamese enterprises are SMEs, while 95 % of all manufacturing enterprises can be recognized as SMEs. In HCMC, accompanied by the increasing economic development, the City is facing a variety of environmental pollution problems to which the manufacturing SME sector contributes significantly. Up till now, no systematic review and assessment has been carried out on the City's environmental pollution control programme towards SMEs. Given that, the research applied the concepts of Political Modernization and developed a suitable environmental policy evaluation methodology in order to analyze three cases of prominent pollution control measures: relocation of polluting enterprises programme, end-of-pipe treatment solutions and the cleaner production approach. Based on those results and experiences drawn from literature, this research aimed to contribute to the improvement of environmental policy towards SMEs in HCMC and the development of new feasible, effective and suitable environmental policies for greening the SME sector.

This doctoral research was performed in the framework of the Research and Education for Industry and Environment II (REFINE II) project, a collaborative education and research programme between Wageningen University, Institute for Housing and Urban Development Studies in the Netherlands and Van Lang University, Hanoi National University, National University of HCMC and Can Tho University in Viet Nam. The project is funded by SAIL International, to which I am sincerely grateful.

I would like to express my profound gratefulness to Prof. Dr. Ir. Arthur Mol, Chair of the Environmental Policy Group, Department of Social Sciences at Wageningen University for presenting me with this wonderful (of course as well laborious) research opportunity, assisting in developing my research, providing insightful comments and critical refinement on the whole dissertation. At the most difficult and exhausting times during this research, I have always been motivated by his essential encouragement and support. I am really grateful to that. Without such incentives and support, it would have been nearly impossible to originate my research as well as completing it.

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Last but not least, I am proud of my big family and I would like to express my deepest thankfulness to my parents, my children and my relatives for their affection and thoughtfulness for me. Especially, I would like to express my profound acknowledgement to my wife, Ms. Phan Thanh Truc, for her love, empathy and

endurance over the years, particularly for her toiling away at my home during my research in the Netherlands. I dedicate this work to my dear family.

Wageningen, February 2006.

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Abbreviations

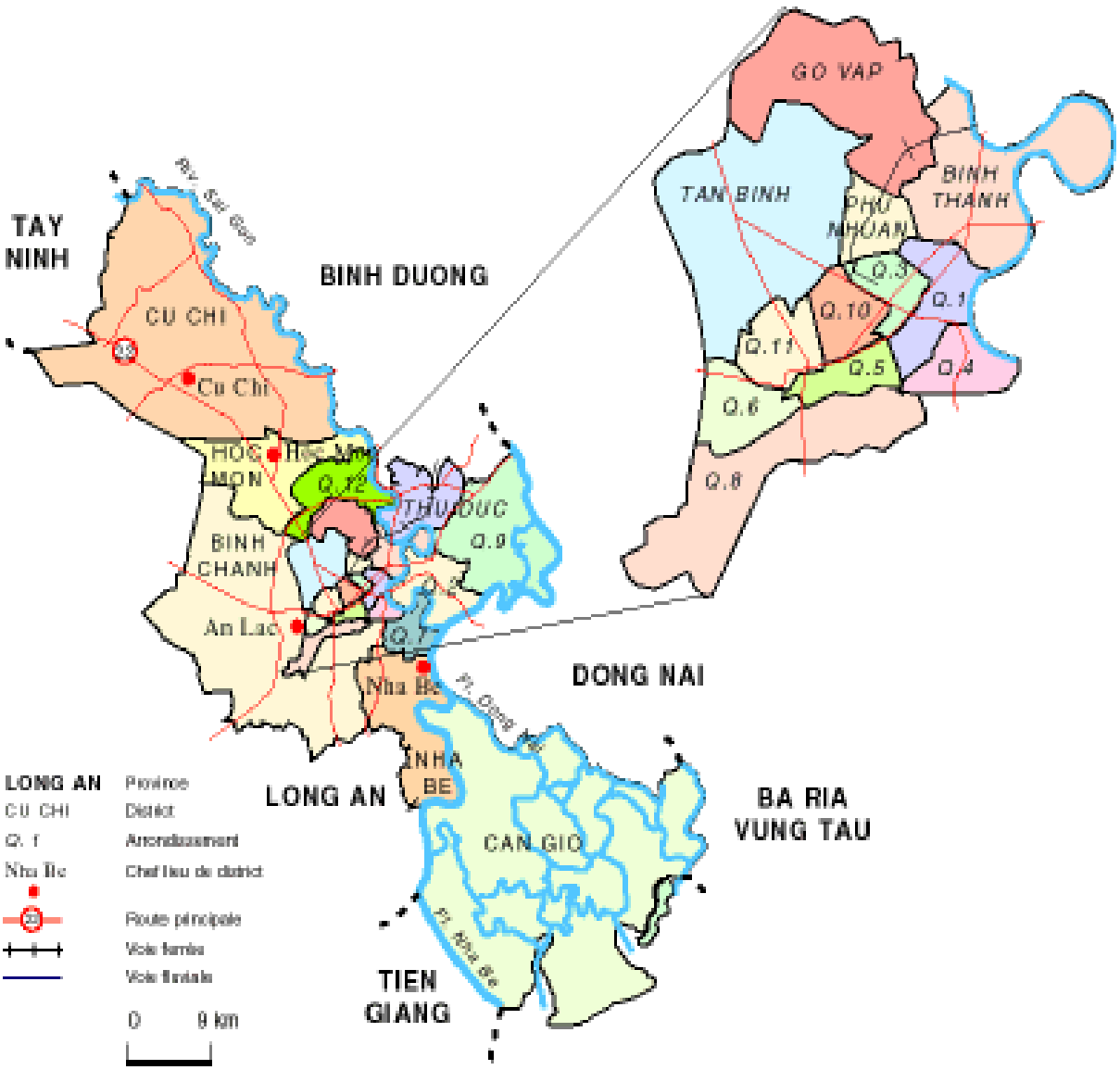
ADB	Asian Development Bank
ADEME	French Environment and Energy Management Agency
AFTA	The Association of Southeast **A**sian Nations **F**ree **T**rade **A**rea
AIT	Asian Institute of Technology
ASEAN	Association of South East Asian Nations
BCCI	Binh Chanh Construction Investment Shareholding Company
BOD	Biological Oxygen Demand
C&C	Command-and-Control
CENTEMA	Centre of Environmental Technology and Management
CIDA	Canadian International Development Agency
COD	Chemical Oxygen Demand
CP	Cleaner Production
DANIDA	Danish Agency for International Development
DARD	Department of Agriculture and Rural Development
DESIRE	Demonstration in Small Industries for Reducing Waste
DETDZ	Dalian Economic Trade and Development Zone
DOTPW	Department of Transportation and Public Works
DOF	Department of Finance
DONRE	Department of Natural Resources and Environment
DOPA	Department of Planning and Architecture
DOSTE	Department of Science, Technology and Environment
DPI	Department of Planning and Investment
DSMED	Department for SME Development
ECE	Economic Commission for Europe
ECO	Environmental Technology Company
EIA	Environmental Impact Assessment
EMAS	Eco-Management and Audit Scheme
EMS	Environmental Management System
ENDA	Environment and Development Action in the Third World
ENERTEAM	Energy Study and Development Center
EoP	End-of-Pipe
EPC	Environmental Protection Centre
EPP	Environmental Product Policy
EPZ	Export Processing Zone
ESTs	Environmentally Sound Technologies
ETC	Environment and Technology Center
ETDZ	Economic and Technological Development Zone
EU	European Union
GDP	Gross Domestic Product
GTZ	German Technical Cooperation
HCI	Heavy and Chemical Industrialisation
HCMC	Ho Chi Minh City
HEPA	HCMC Environmental Protection Agency
HEPZA	HCMC Export and Industrial Zones Authority
HIFU	HCMC Investment Fund for Urban Development
HPA	HCMC Plastic Association
HTV	HCMC Television

IDRC	International Development Research Centre
IER	Institute of Environment and Resources
IFC	International Finance Corporation
INCPC	Indian National Cleaner Production Council
IP	Industrial Park
IPP	Integrated Product Policy
ISO	International Standards Organisation
IZ	Industrial Zone
JODC	Japan Overseas Development Cooperation
JV	Joint Venture
LEP	Law on Environmental Protection
LMX	Le Minh Xuan
MARD	Ministry of Agriculture and Rural Development
MBI	Market-Based Instruments
MEANS	Methods of Evaluating Structural Policies
MOF	Ministry of Finance
MOI	Ministry of Industry
MONRE	Ministry of Natural Resources and Environment
MOSTE	Ministry of Science, Technology and Environment
MPI	Ministry of Planning and Investment
NEAs	Negotiated Environmental Agreements
NGO	Non-Governmental Organization
NSEP	National Strategy for Environmental Protection
O&M	Operation and Maintenance
OECD	Organisation for Economic Co-operation and Development
PC	People's Committee
POEMS	Product-Oriented Environmental Management System
PP	Pollution Prevention
PPP	Polluter Pays Principle
PRISMA	Project on Industrial Successes with Waste Prevention
SEAQIP	Seafood Quality Improvement Programme
SFEZ	Southern Focal Economic Zone
SIDA	Swedish International Development Agency
SME	Small and Medium-Sized Enterprise
SOE	State-Owned Enterprise
SS	Suspended Solids
SWEDECORP	Swedish International Enterprise Development Corporation
TB	Tax Bureau
TCVN	Tieu chuan Viet Nam (Vietnamese Standard)
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organisation
USA	The United States of America
US-AEP	United States - Asian Environmental Partnership
US-EPA	United States - Environmental Protection Agency
US$	United States Dollar or American Dollar
VCCI	Viet Nam Chamber of Commerce and Industry
VEPA	Viet Nam Environmental Protection Agency

VNCPC	Viet Nam Cleaner Production Centre
VND	Vietnamese currency (Dong)
VOCs	Volatile Organic Compounds
WB	World Bank
WEC	World Environment Centre
WECD	World Commission for Environment and Development
WTO	World Trade Organization
WWTP	Wastewater Treatment Plant

Map of Viet Nam

Map of Ho Chi Minh City and its districts

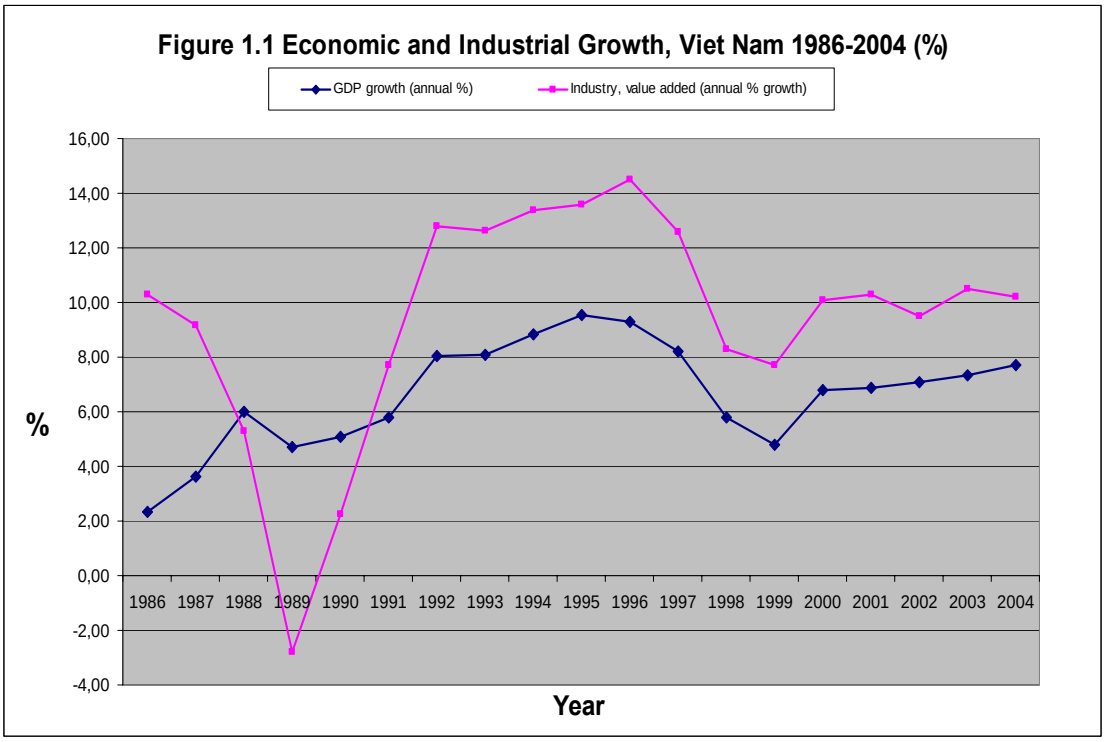


Source:www.angelfire.com/co/hongnam/vnmap/hochiminh.html

1. INTRODUCTION

1.1 VIET NAM'S INDUSTRIAL TRANSITION AND ACCELERATION

Viet Nam is a country of about 82 million people, of which the majority (76%) lives in rural areas (at the end of 2004)[1]. In the spirit of the 'doi moi' (renovation) policy adopted by the Government in 1986, Viet Nam has shifted from a centrally planned system to what is labeled a 'market-oriented socialist economy'. As a consequence, Viet Nam has made remarkable economic progress. From 774.7% in 1986, the inflation rate dropped to a modest 6% in 1996 and 9.5% in 2004. Gross domestic product (GDP) growth rate rose from 3.25% per year during the period of 1987-1990 to 7.6% per year in the period of 1991-2002[2]. Industrial development seems to have led this major economic development, with double-digit growth rates for most of the years since 1990 (average of 11.6% per year over the same period) (see Figure 1.1). In 2004, GDP reached US$ 44.4 billion, with real GDP growth 7.7%. Industry was responsible for 33.8 % of GDP in 2004[3].



(Source: General Statistics Office, ADB)

The role of small and medium-sized enterprises (SMEs) in Viet Nam's economic development has been increasingly recognized, encouraged and supported by the Vietnamese government. For various reasons, as will become clear throughout this dissertation, small and medium-sized enterprises are perceived as crucial contributors to Viet Nam's economic development. At the same time external constraints (such as

[1] Source: General Statistics Office, 2005.

[2] In comparison, the world average during the period was about 2.7%, while the average for the low-income countries was about 3.3% (cf. ADB, 2004).

[3] Source: http://www.sme.com.vn/Article.aspx?TopicID=107; http://www.state.gov/r/pa/ei/bgn/4130.htm; http://www.undp.org.vn/undp/fact/base.htm; http://www.un.org.vn/unido/factsaboutvn_industrial.htm; United Nations Country Team, 2004; Heberer and Kohl, 1999.

the transitional legal and administrative framework, scarcity of financial resources, intensive competition) as well as the internal constraints of company management exert great pressures on SMEs in Viet Nam and limit a smooth development path for SMEs.

This chapter starts with introducing the existing situation of SME development in Viet Nam and particularly in Ho Chi Minh City (HCMC), followed by the environmental impacts that relate to the growth of small and medium-sized enterprises in Viet Nam. Following these environmental consequences of SMEs the central research objectives, questions and the scope of research are formulated. The chapter concludes with an outlook to the other chapters of this thesis.

1.2 SMEs IN VIET NAM

In 1986, the Communist Party and the State of Viet Nam adopted economic reforms. The most important feature of these economic reforms entailed the shift from the centrally planned economic model based on bureaucratic directives and government subsidies to a market economy with socialist orientation. The subsequent efforts of the Government in the last two decades established a much more favourable economic environment for private enterprises, which blossomed and operated alongside the conventional state-owned enterprises (SOEs) and cooperatives. Under the current legal framework, in terms of ownership, enterprises in Viet Nam can be divided into the following categories: SOEs, cooperatives, private Vietnamese limited companies, private Vietnamese share holding (joint stock) companies, private Vietnamese individual enterprises (sole proprietorships), foreign invested joint ventures, and companies with 100% foreign capital[4]. Generally, SMEs tend to be individual private enterprises and limited liability companies. In addition, other types of enterprises, such as individual and household businesses also exist under the label "micro enterprises", as these are too small to be SMEs.

In line with the established policy of industrialisation, modernisation, and integration into the region and the world, the 8th Party Congress (1996) set forth specific directions "to mainly develop the small and medium-sized enterprises that are based on appropriate technology which require less investment, create more jobs, and require less time to recover the capital costs". The leading Communist Party and the Government of Viet Nam strengthened their attention to the role of enterprise reform and trade liberalisation, aiming to increasing the efficiency and competitiveness of enterprises, not in the last place the small and medium-sized ones.

In a speech given on 12 January 1998, Prime Minister Phan Van Khai stressed once again the importance of SMEs by reminding the leaders of institutional agencies and localities all over country:

> "*to increase the competitive power needed to sell products, it is very necessary to utilise and develop production capacity and increase efficiency, which helps to increase domestic savings and improve the living standard. (...)Pay*

[4] According to Ronnås (1998) the terminology in English of the different ownership forms of non-state enterprises is not consistent and often confusing. Limited liability companies (*cong ty trach nhiem huu han*) and share holding companies (*cong ty co phan*) are often combined into one category, while the distinction between collectives (*tap the*) and co-operative (*hop tac xa*) is far from clear.

attention to the activities and sectors that require less capital, create more jobs, and step by step introduce the activities with high technology, using both intermediate inputs produced domestically and imported from abroad".

In 1998, the Government of Viet Nam issued Document 681/CP-KTN in which it defined SMEs as enterprises that have a maximum registered capital of VND 5 billion (US$ 387,600)[5] and employ less than 200 employees. Within the overall definition of SME set fort in Document 681, in 2001 the Government provided a formal definition of SME in Decree No. 90/2001/CP-ND. According to this decree, SMEs "are independent business entities, which have registered their business in accordance with prevailing laws, with a registered capital of VND 10 billion maximum or an annual average number of labour of up to 300 people" (VND 10 billion is about US$ 670,000).

At the moment SMEs are an important group of enterprises in Viet Nam. Following the definitions above and according to an evaluation of ADB (2004), it is estimated that more than 90% of all private Vietnamese enterprises are SMEs, while UNIDO$_{(a)}$ recognised that 95 % of manufacturing enterprises can be labeled SMEs.[6] The majority of registered enterprises employs between 5 and 50 regular workers; of all SMEs 80% of enterprises count less than 50 workers. SMEs employ almost 50% of the non-agricultural labour force in the country and are the fastest growing category of enterprises in terms of number. In the key field of manufacturing, SMEs employ some 36% of the total employees. A small manufacturing enterprise has on average 16 employees, a medium-sized enterprise about 102.[7]

1.3 SMEs IN HO CHI MINH CITY

Accounting for 0.6% of Viet Nam's total land area and 7% of the total population (see Table 1.1), HCMC is part of the Southern Focal Economic Zone (SFEZ)[8] and is the country's large economic, cultural and scientific center.

Table 1.1 Ho Chi Minh City in comparison with the whole country (%)

	2001	2002	2003	2004
Natural area	0.6	0.6	0.6	0.6
Population	6.7	6.8	7.0	7.0
Gross Domestic Product (GDP)	17.6	18.0	18.4	18.5
Total industrial output	29.4	29.6	29.4	28.8

(Source: Statistical Office of HCM City)

[5] According to the exchange rate prevailing as of the date of issuance of Document 681

[6] Based on the SME definition of Document 681, Sakai and Takada (2000) recognized that 97% of non-state owned companies in Viet Nam fall under the category of SMEs.

[7] General Statistic Office, 1997. Some major indicators on the capital size and efficiency of 1.9 million production and business units in Viet Nam. Statistical Publishing House, Hanoi, Table 4, pp. 16-39 and Table 5, pp. 40-51.

[8] SFEZ comprises the City, Dong Nai, Ba Ria-Vung Tau, Binh Duong, Long An, Tay Ninh and Binh Phuoc provinces.

HCMC has always realized high levels of economic activity and was constantly leading in terms of economic growth. In 2004, its GDP growth rate reached 11.6%, the service sector increased 11.1%, and construction and industry rose 15.1%. The city's high economic growth rate and the sheer size of its economy make it an important contributor to the country's GDP. The GDP of HCMC accounts for nearly one-third of Viet Nam's total, its GDP value in 2004 was more than VND 136.5 trillion (US$ 8.6 billion), compared with the national GDP value of VND 362.1 trillion (US$ 22.8 billion).[9]

The industry and construction sector contributed 48.5% of the GDP of HCMC in 2004. The sector was responsible for 6% of the overall city growth rate (which was 11.6%). Major industrial products are garments, footwear, electricity, automobiles, electronics, food, mechanical products, motorcycles, plastics, rubber tires and computers. In 2004, HCM City's industrial output value was more than VND 66.2 trillion (US$ 4.2 billion). Characteristic of the industrial structure of HCMC is that large industries are mainly located in special industrial zones in and around HCMC, while the majority of SMEs are situated in the City. The classification of enterprises in HCMC by ownership is showed in Table 1.2 below. The non-state sector accounted for the largest share of industrial output with 35%, followed by foreign investment sector with 34% and state-owned sector with 31%.[10]

Table 1.2 Classifications of Manufacturing Enterprises by Ownership

	1998	1999	2000	2001	2002	2003	2004
Total	**24,395**	**26,590**	**27,865**	**2,698**	**31,632**	**35,815**	**35,096**
State-owned sector	**285**	**282**	**278**	**278**	**231**	**217**	**217**
Central	121	124	121	114	117	106	106
Local	164	158	157	115	114	111	111
Non-state sector	**23,791**	**25,992**	**27,274**	**28,101**	**30,920**	**35,107**	**34,377**
Collective	-	-	76	72	73	75	75
Private	-	-	1,351	1,846	2,661	3,240	3,335
Household	-	-	25,802	26,123	28,126	31,716	30,891
Foreign-invested sector	**319**	**316**	**313**	**428**	**541**	**567**	**578**

Note: - = not available.

(Source: Statistical Office in HCMC)

No detailed survey has even been carried out on the number of SMEs (based on the definition of SME from Decree 90/CP), their classification neither on the contribution of SMEs to the socio-economic development of HCMC. According to the Department of Industry (DOI, 2005), most SMEs locate in residential areas and form 97% of all manufacturing enterprises in HCMC. Together, their employees count 931,000 people, around 35.8% of labour force in HCMC. In all, small and medium-sized manufacturing enterprises form an important economic category in HCMC.

[9] Source: General Statistical Office, 2005; Statistical Office in HCMC available at: http://www.pso.hochiminhcity.gov.vn/so_lieu_ktxh/2004/Cac_chi_tieu_tong_hop_va_muc_song/0301.htm

[10] Source: Statistical Office, available at: http://www.pso.hochiminhcity.gov.vn/so_lieu_ktxh/2004/Cong_nghiep/0418.htm

1.4 ENVIRONMENTAL PROBLEMS CAUSED BY SMEs IN HCMC

HCMC is facing a variety of environmental and health problems (cf. Phung, 2002; Frijns et al, 2000). While poor domestic infrastructures (of water, waste, roads, energy) for a growing population forms a significant cause, industrial activities are at least equally important. No thorough survey or investigation has been held to assess the contribution of SMEs activities to the City pollution levels yet. According to environmental authorities' assessments, most SMEs are equipped with obsolete manufacturing technologies, have no environmental protection facilities and thus contribute significantly to the pollution intensity in the city, endangering its residents and the environment. SME pollution often relates to the release of smoke, bad smell, noise, dust, and harmful and toxic contaminants to the air, soil, surface and ground water. Textile/dyeing, food processing, pulp and paper, electroplating, and rubber industries are usually indicated by governmental agencies and independent researchers as the sectors causing the most serious and severe pollution problems (cf. SMEC, 1999). A number of figures on environmental pollution from SMEs in HCMC is introduced in detail in chapters 5, 6 and 7.

Environmental pollution complaints from neighbour residents are another indicator that indirectly tells us something on pollution levels to which residents are exposed. Table 1.3 shows the number of environmental complaints from City's inhabitants during the years 1995-2003, as well as data for two districts involved in the thesis research. According to the evaluations of environmental officials of City and related districts, about 70-80% of the environmental complaints recorded relate to SMEs[11].

Table 1.3 Statistical Data of Environmental Pollution Complaints from Residents in HCMC and some Districts

Area	1995	1996	1997	1998	1999	2000	2001	2002	2003	Annual average
City[12]	369	273	312	229	199	260	220	225	184	252
District 11[13]	105	81	85	64	44	50	54	45	29	62
Tan Binh District	75	109	100	127	97	144	-	122	267	130

Notes: - = not available.

(Source: DOSTE-HCMC)

In order to resolve these adverse environmental effects, the City authorities have implemented several policies and measures from the mid 1990s onwards, mainly following traditional command and control regulation: end-of-pipe treatment solution, fines and penalties, relocation and even forced closure of polluting enterprises. In addition, the city authorities have begun to introduce innovative measures and

[11] Personal interviews

[12] City refers to environmental pollution complaints of the whole city, which are send directly to the Department of Science, Technology and Environment (DOSTE). These numbers do not include complaints sent to District's environmental authorities.

[13] District 11 and Tan Binh are two HCMC districts with large numbers of small and medium-sized manufacturing enterprises. Data of environmental complaints in these districts are the ones recorded by district authorities.

policies, such as economic (e.g. cleaner production, revolving fund and other subsidies, and environmental fees[14]) and communication (e.g. Black Book and Green Book, environmental propaganda, training and education) measures in industrial pollution control. However, one should recognize that none of these specific policy measures exclusively aims at the SME sector. Most of them are general measures applied to all industries.

After more than a decade of policy implementation, the first results of environmental improvements should be visible and noticeable. We might expect that a developing country such as Viet Nam meets various difficulties in implementing environmental policies and measures towards the scattered and numerous small and medium-sized enterprises, These difficulties relate both to the capacity of authorities in developing countries (e.g. lack of man power, professional knowledge, equipment, finances, information, etc.) as well as to the specific conditions and characteristics of SMEs (heterogeneous polluters, large informal sector, limited finances, low environmental awareness, etc.). How do the authorities of HCMC combine economic importance and environmental pollution of SMEs? What kind of environmental programme have been developed and implemented in HCMC for the SME sector? How successful was this implementation and what factors contributed to successes and failures? Up till now no systematic review and assessment has been carried out on the City's environmental pollution control program towards small and medium-sized industries. It is against this background that the current research should be situated.

1.5 RESEARCH OBJECTIVES

The increasing importance for and potential contribution of SMEs to the socio-economic development of Ho Chi Minh City (and Viet Nam) will not easily result in a future decline of SMEs in HCMC. But there is a growing need to improve the environmental quality in the city and the adverse environmental and health impacts of SMEs are a critical factor in that. The city government has started to address the environmental and health effects of SMEs via various programmes and policies. Against this background the central research objective is to contribute to the improvement of existing environmental policies and strategies, aiming at a sustainable development of SMEs in HCMC.

To achieve this, the research will subsequently address two sub-objectives. The first one is the systematic evaluation of the implementation of governmental environmental policies and measures towards SMEs, in order to detect the strengths and weakness of the current environmental policies and their implementation. The second sub-objective focuses on the formulation of adaptations and improvements of the existing environmental policies and strategies, resulting in a feasible, operational strategy for environmental management and pollution control towards SMEs.

Following the above objectives, the central research questions are:

1. What have been the effects and effectiveness of existing pollution control policies towards SMEs in HCMC?

[14] In 2005, environmental fees for domestic and industrial wastewater are applied in Viet Nam.

2. Which factors explain the successes and failures of existing environmental policies towards SME?

3. How can the existing environmental policies towards SME be improved, and thus the environmental impacts of SMEs be reduced?

The research is designed to answer these questions and to meet the objectives, and can be characterised as a policy evaluation research. Through the evaluation of existing environmental policies and programmes in HCMC we aim to acquire knowledge and insight on the successfulness of these policies and programmes, the reasons and causes of their success and failures, and based on this information design improvements for future programmes. As will be elaborated further in chapter 4, the specific conditions of Viet Nam (with among others limited data availability), as well as the nature of the research questions will result in a qualitative case study approach.

1.6 SCOPE OF RESEARCH AND STRUCTURE OF THESIS

Given the characteristics of SMEs such as vast numbers, dispersed position, intrasectoral diversity (in size and product), inability to deal barriers (such as limited financial and technical abilities, attitudinal and organisational constraints, low awareness of law and regulations, etc.), it is obvious that the establishment of an environmental policy/strategy for SME is demanding.

The research will neither analyse technology aspects nor financial aspects in detail, but focuses on institutional aspects. For this purpose, the role of governmental agencies in establishing environmental policy measures to SME in HCMC-Viet Nam (the state-industry relationship) is the main target. The analysis and evaluation are based on case studies that are chosen from existing pollution control approaches in HCMC including relocation polluting enterprises to industrial zones, end-of-pipe treatment (centralized wastewater treatment facility and decentralized end-of-pipe treatment facility), and cleaner production.

This thesis consists of eight chapters. Chapter 1 so far has introduced an overview of the development of SME in Viet Nam and HCMC and its environmental adverse impacts. In addition the research objectives, scope of research and thesis' structure were introduced. Chapter 2 consists of a conceptual framework that provides a number of notions related to the term of 'small and medium-sized enterprise' (SME). Firstly, the definitions of SME of some different countries around the world are presented. Secondly, the role of SMEs in social-economic development is introduced generally. Thirdly, the characteristics of SME including some differences between large-scale enterprises and SMEs, are highlighted. Fourthly, the development of SME in Viet Nam is described. This chapter continues with an overall assessment of the environmental impact caused by manufacturing of SMEs. And finally, the chapter is closed with the main environmental institutions and legislation in Viet Nam. Chapter 3 presents a theoretical framework based on the Ecological Modernisation theory. This theory will be presented in two contents: the emergence and the core features of Ecological Modernization. Its third core feature is also known as Political Modernization, to which is paid special attention in this chapter and then will be used to analyze and understand the relationship between State and SMEs in contemporary environmental policy in HCMC. Chapter 4 aims to seek and develop a suitable

approach to evaluate the policy measures for industrial pollution control in HCMC, which includes key evaluation criteria, an evaluation framework and main steps to evaluate an environmental policy. Subsequently, the policy network theory is introduced as an analytical tool to investigate the relations and interactions between the main actors in policy making and implementation, to explain the outcome of policy measures as well as the successes and/or failures of policies. Finally, this chapter focuses on establishing the applied research methodology and methods of the research. Next chapters, from chapter 5 to chapter 7 contain three case studies that will assess the effect of pollution control policies to SMEs in HCMC. These case studies focus on prominent pollution control measures, including relocation polluting enterprises to industrial zones (chapter 5), end-of-pipe treatment solution (chapter 6) and the cleaner production programme (chapter 7). Each of these chapters includes an overview of the related policy implementation, analysing its advantages and shortcomings, and evaluating the relation between state and enterprise. And lastly, based on applying Political Modernization theory and using a comparative analysis of the three case studies, and experiences drawn from literature, chapter 8 will give overall conclusions on the current environmental policies to SMEs in HCMC. This chapter closes with recommendations for a comprehensive environmental strategy towards SME sector in HCMC.

2. SMALL AND MEDIUM-SIZED ENTERPRISES AND ENVIRONMENTAL INSTITUTIONS

This chapter provides a background overview of two of the core objects of this study: Small and medium-sized industries and governmental institutions on the environment. Various notions related to 'small and medium-sized enterprises' (SMEs) and environmental governance will be introduced. The chapter starts with definitions of SMEs, presenting the variation and diversity in that in different countries (and even among experts within a country) around the world. Second, the role of SMEs in social-economic development is specified. Third, the characteristics of SME, including differences between large-scale enterprises and SMEs, are highlighted. This is essential to discover the most suitable policies for this sector. Fourth, the development of SMEs in Viet Nam and their role in Vietnamese socio-economic development shall be described. In addition, constraints and problems faced by Vietnamese SMEs are introduced. The chapter continues with an overall assessment of the environmental impact caused by the manufacturing of SMEs in Viet Nam. Finally, the last section presents an overview of the main environmental institutions and legislation in Viet Nam, that provide the background for environmental governance towards SMEs.

2.1 HOW TO DEFINE SMALL AND MEDIUM-SIZED ENTERPRISES?

In answering the question how to define small and medium-sized enterprises, it should be noted that the classification criteria regarding small and medium-sized enterprises vary from country to country and from expert to expert. According to Hillary (2000), definitions for SMEs are very blunt instruments when understanding the variety of businesses in the sector. There are broadly speaking two categories of definition: operational definitions and theoretical definitions. The first are used for working purposes, e.g. to provide a cut-off level in the awarding of subsidies or to develop special policies. The latter are employed to characterise the sector (see Table 2.1 and Table 2.2). The limitation of every definition is the incapability to take the undeniable importance of the sector's diversity into account.

Table 2.1 Selected operational SME definitions *(Source: Hillary, 2000)*

Function of definition	Maximum no. of employee	Turnover (ECU million)	Maximum balance sheet (ECU million)	Other criteria for information	Source
Statistics on SMEs Micro-sized enterprises Small-sized enterprises Medium-sized enterprises Large-sized enterprises	 1-9 10-99 100-499 ≥ 500				European Commission DGXXIII and Organisation for Economic Co-operation and Development (OECD)'s Working Body for SMEs
*State financial aid to SMEs** Small-sized enterprises Medium-sized enterprises	 50 250	 5 20	 2 10	Maximum 25% of capital to be owned by big enterprise (with exception)	European Commission DGXXIII

Annual account[#] Small-sized enterprises Medium-sized enterprises	 50 250	 4 (5) 16 (20)	 2 (2.5) 8 (10)		European Commission DGXXIII
Government grants Small-sized enterprises Medium-sized enterprises	 100 250-500				Department of Trade and Industry (DTI)
To define target population for projects Micro enterprises SME	 < 20 100-500			Some projects will define a target 'SME' population	International Finance Corporation (IFC)

Note: * It is sufficient to verify one of the two criteria (turnover or balance sheet) besides the number of employees; [#] It is sufficient to verify two of the three criteria (maximum number of employees, turnover, maximum balance sheet). Figure in brackets are concerned with the review proposed by the Europe Commission to the Council in 1993.

Table 2.2 Selected theoretical SME definitions *(Source: Hillary, 2000)*

Term/Issue	Definition
Small and medium-sized enterprises	Enterprises with fewer than 500 employees, whose capital is less than ECU 75 million and of which less than one-third may belong to a larger company (Gondrand, 1992)
General definition of a small firm More specific definition	A small firm is an independent business, managed in a personalised way by its owner or part-owners, and with a small market share (Bolton Report, 1971) Manufacturing — Maximum 200 employees Retailing — Turnover up to £50,000 per annum Wholesale trades — Turnover up to £200,000 per annum Construction — Maximum 25 employees Mining/quarrying — Maximum 25 employees Motor trades — Turnover up to £100,000 per annum Miscellaneous services — Turnover up to £50,000 per annum Transport — Maximum 5 vehicles
Update of turnover figures from the Bolton Report to 1983 figures	Update of turnover figures from the Bolton Report to 1983 figures (Sengenberger et al. 1990) Retailing — Turnover up to £315,000 per annum Wholesale trades — Turnover up to £1,260,000 per annum Motor trades — Turnover up to £630,000 per annum Miscellaneous services — Turnover up to £315,000 per annum
Best indicator of small enterprise	Major policy decisions are taken by one or two persons who usually own, manage and risk their own money in the business (Clarke, 1972)
General definition	A small firm is one that has a small share of its market, is managed in a personalised way by its owner or part-owner and not through the medium of an elaborate management structure and which is too small to have access to the capital market for the public issue or placing of securities. A branch of a large company cannot be a small firm, because, although it is small and may even be independent with regards to decision making, it still has access to capital and technical assistance from the parent company (Bannock, 1981)
Business format franchising – a form of small business	The franchise not only sells the franchiser's product or service but does so in accordance with precisely laid-down procedures. In return the franchiser provides the franchisee with assistance, e.g. training, marketing, management, research and development, in carrying on his/her business; however, like any other small business, the franchisee provides the capital for his/her business, but agrees to run the business in accordance with the franchiser's guidelines (Hough, 1982)
Problems with the Bolton Report definition of small firms	If a small firm, in statistical and organisational terms, was the sole supplier of particular goods to a large company, the small firm would have 100% of the market share but would still be considered by many as small. Possibly because the market share of the firm has grown beyond the stage of smallness but the ownership and management are still highly centralised (Chestermann, 1982)

A clear example of the multitude of definitions is the situation in the European Union. In recent years, a range of programmes to assist and support SMEs has been introduced at the European policy level, complementing measures taken at national levels of EU countries. However, these measures do not all adopt the same approach when defining SMEs, resulting in a use of various definitions within the EU (but also beyond). This variation in definitions results in inconsistencies and contributes to a distortion of competition between enterprises, therefore it was criticised by the Court of Auditors in its 1995 Report, and by the European Parliament. The latter requested the Economic Commission for Europe (ECE) to address the question of defining a SME exactly (cf. UN-ECE, 1998). According to the recent recommendation of the ECE, SMEs are classified as in Table 2.3.

Table 2.3 Classification of SMEs in the European Union

Criteria	Micro	Small-sized	Medium-sized
Max. number of employees	< 10	< 50	< 250
Max. turnover in million ECU	-	7	40
Max. balance sheet total in million ECU	-	5	27

(Source: UN-ECE, 1998)

With this definition, the criteria for number of employees and at least one of the financial criteria must be met.

Although the definition of SME varies by country, it is usually based on the number of employees[15] or the value of assets. For instance, according to Frijns and van Vliet (1999), the size of industrial enterprises, at least in developing countries, can best be measured by the number of employees. Based on a literature review, they suggest to define small industries is two categories: micro-enterprises (1-9 employees) and small-scale industries (10-50 employees). In terms of number of employees, for example, the United States and Danish SMEs have fewer than 500 employees, the Mexican and Brazilian SMEs have between 1-100 staff, and Australian SMEs employ fewer than 200 people (cf. Hillary, 2000). (See Appendix 1: Official Country Definition of SME).

In this research, the definition used to define a SME is the one stated by the Vietnamese Government (see in detail in Box 2.2).

2.2 OVERVIEW ON THE ROLE OF SMEs IN DEVELOPMENT

Pillath et al. (2002) state that SMEs are either regarded as a problem or a high potential, depending on the political perspectives and the theoretical positions.

[15] However, according to Hallberg (2000), one should not be overly concerned about the lack of consistency in employment-based SME definitions, since the number of employees, viewed in isolation from the size of markets or the economy, may be misleading.

According to the first view, SMEs face difficulties because of their limited size, making especially innovating and financing troublesome as small enterprises are believed to have less access to resources and knowledge. The second view emphasizes the flexibility and entrepreneurial dynamics of SMEs, and hence, their advantages in exploitation of market opportunities. Both views, however, join in their assessment that SMEs play an important role in the economic growth and employment in most countries. SMEs can and largely do play an extremely important role in promoting the socio-economic development of a country. The development role and potential of SMEs include the following five aspects.

Firstly, they usually produce many goods for domestic consumption, as well as capital goods in the form of machinery, equipment, tools, and component parts needed by industries producing consumer goods and handicrafts.

Secondly, SMEs can create jobs for a large number of labourers. SMEs make up over 90% of businesses worldwide and account usually for between 50-60% of national employment (Raynard and Forstater, 2002). A number of remarkable figures on SME's employment in different countries and regions around the world give evidence of this employment record. In developing countries, between 17-27% of the labour force is employed in micro and small-scale enterprises (Mead and Liedholm, 1998). In Africa and Asia, the small-scale (non-farm) enterprises provide 20-45% of full-time employment and 30-50% of rural household income (Haggblade and Liedholm, 1991). In addition, it is recognised that nearly 60-70% of the total labour force in the manufacturing sector of most Asian countries is employed by SMEs (Thiruchelvam et al., 2003). Latin America has an estimated 50 million micro and small-scale enterprises, employing 120 million people (Berger and Guillamon (1996): Scott, 1999). In the UK, small firms constitute approximately 99% of all business and of the 3.724 million firms in the UK (1996), 3.693 million employed less than 50 employees. In the United States the number of SMEs in 1992 made up about 99.7 % of all firms, and in the European Union this number was 99.9% of all firms (1999) of which 93.3% were micro-enterprises (with fewer than 10 employees) and 6.2% had between 10-100 employees (cf. Geiser and Crul (1996): Tilley, 1999). In the Netherlands, SMEs comprise a significant portion of the Dutch industry (over 90% of companies) and are the major source of employment (Gombault and Versteege, 1999). In Bangladesh, enterprises with fewer than 100 workers accounted for 99 percent of the enterprises and 58 percent of employment in 1986 (cf. Hallberg, 2000). It can thus be stated that the SME sector contributes significantly to the generation of employment and thus income, and ultimately the reduction of poverty.

Thirdly, SMEs are effective in developing and utilising domestically mobilised financial funds and domestically available raw materials or intermediate inputs. SMEs also contribute to efforts to spread industry to (residential) areas, thereby helping to reduce development gaps between different areas and stimulate a balanced development in the different regions throughout the country.

Fourthly, SMEs complement large industries by providing them with both the inputs and the competition needed to speed up the development process and improve the country's overall competitiveness.

Lastly, SMEs can contribute substantially to sustaining and developing traditional handicraft occupations and produce goods associated with the national culture.

Table 2.4 presents the share of SMEs in total employment and GDP, as well as GDP per capita in some countries. The importance of the SME sector varies greatly across countries.

Table 2.4 Share of SMEs in GDP and employment

Nation	GDP/CAP (US$)	SME250 (%)	SMEOFF (%)	SME_GDP (%)
Argentina	7,483.77	70.18	70.18	21.80
Australia	20,930.40		50.60	15.30
Austria	29,619.35	66.10	66.10	10.45
Azerbaijan	558.29	5.34	5.34	47.20
Canada	19,946.50		58.58	11.75
Chile	4476.31	86.00	86.50	27.60
Colombia	2289,73	67.20	67.20	30.05
Czech Republic	5015.42	64.25	64.25	12.35
Germany	30239.82	59.50	70.36	12.80
France	27235.65	67.30	62.67	12.10
United Kingdom	19360.55	56.42	56.42	10.40
Indonesia	963.33		79.20	
Japan	42520.01	71.70	74.13	11.10
Korea, Rep.	10507.69	76.25	78.88	38.00
Mexico	3390.17	48.48	48.48	38.50
Netherlands	27395.01	61.22	58.50	12.65
Norway	33657.02	.	61.50	11.30
Philippines	1099.31	66.00	66.00	16.45
Russian Federation	2614.38	13.03	13.03	34.30
Singapore	22873.66		44.00	13.00
Sweden	27736.18	61.30	56.50	13.80
Switzerland	44716.54		75.25	8.55
Thailand	2589.83	86.70	86.70	71.00
Taiwan, China	12474.00	68.60	68.60	16.50
United States	28232.07		52.54	12.20
Viet Nam	278.36	74.20	74.20	
South Africa	3922.60		81.53	
Zambia	418.93	36.63	36.63	

Notes: The variables are defined as follows: GDP/CAP is the real GDP per capita in US$. SME250 is the SME sector's share of formal employment when 250 employees are used as the cut-off for the definition of SME. SMEOFF is the SME sector's share of formal employment when the official country definition of SME is used (see Appendix 1). SME_GDP is the SME sector's contribution to GDP (the official country definition of SME is used). Values are 1990-99 averages for all the variables

(Source: Ayyagari, Asll and Kunt, 2003)

2.3 CHARACTERISTICS OF SMEs

Policies, approaches and instruments for one sector of the economy are not automatically suitable and appropriate for other sectors. As has been explained in the previous paragraph SMEs have their own characteristics, which are distinct from large-scale enterprises. Therefore regulations and policies sometimes have to be designed towards the specific characteristics of SMEs, and general national policies might not work.

According to Grando and Belvedere (2005), there is a number of key differences between large enterprises and SMEs. The key strengths of SMEs, compared to large-scale firm, are their flexibility, simple and fast decision-making structure, and the commitment of employees. Weaknesses are related to the lack of technical superiority, infrastructural facilities and financial resources (cf. Dangayach and Deshmukh (2001): Grando and Belvedere, 2005). Gärdström and Norrthon (1994) suggest that the larger enterprises often have far more resources, which allow them to develop pollution control measures in quite a different way from SMEs. For instance, large enterprises can influence suppliers and, to some extent, customers, but are also strongly dependent on them. In general, this is less so for SMEs. In line with this view, Hillary (2004) also affirms that legislation and regulators are important driving forces for general environmental improvements in SMEs, while the specific requirements of customers and consumers are less important.

Besides that, according to Dasgupta (2000), the relation between capital, labour and technology in small-scale enterprises in developing countries are more influenced by the socio-economic and cultural context, than by efficiency needs of production processes. The dominant socio-economic condition in developing countries, structural poverty and limited livelihood opportunities for many social categories, has a major influence on SMEs. Small enterprises are often the only opportunity to generate income, for entrepreneurs with limited capital and knowledge as well as for workers with little or no resources or skills. According to Dasgupta (2000) the specific relations between capital, labour and technology for SMEs have three kinds of characteristics: economic, social and technical.

First, three economic characteristics of small enterprises can be recognized. (1) They have a short-term perspective of profit maximisation, even though it often means lower income in the long run. (2) There is a considerable intrasectoral diversity in size and product. The enterprises can vary from employing 2-3 workers up to 20-30. The products/activities are also diverse.[16] The size variations bring about the issue of affordability paramount, while product diversity means that multiple waste streams have to be tackled. (3) The majority of workers are drawn from low-income household with few skills. The position of the workers is extremely unstable.

Second, there are characteristics relating to the social aspect: (1) The ability to handle and absorb new information is generally limited, while information levels are generally low. This constrains product marketing as well as environmental information dissemination; (2) the managerial and technical ability among owners and managers is generally low, and entrepreneurs often lack adequate education and skills.

[16] Including machine tools; bleaching and dying of textiles; acid, chemical and paints processing; plastic moulding; metal finishing; foundries; brick making; rubber processing; food processing; pulp and paper, etc.

Third, the choice of technology in small enterprises is adapted to the availability of capital, land, raw material and skills (locally and in the family). The technology used in small-sized enterprises is often cheap, off-patent, soon outdated, and inefficient.[17]

2.4 SMALL AND MEDIUM-SIZED INDUSTRIES IN VIET NAM

2.4.1 SMEs and Vietnamese socio-economic development

The existence of the private sector in Viet Nam has been officially recognized since 1990, at which time the Company Law and the Law on Private Enterprises were promulgated. Most important has been the Constitution of 1992, which recognized the legality and rights of various economic sectors including the right to equal treatment among all economic sectors, while preserving the leading role of the state in the economy:

> *"The aim of the State's economic policy is to make the people rich and the country strong by releasing all the productive potential and developing all the latent possibilities of all components of the economy - the State sector, the collective sector, the private individual sector, the private capitalist sector and the State capitalist sector in various forms".*

In addition to the constitution, there have been several major pieces of legislation designed to realise this basic principle in Viet Nam.[18]

Against the institutional and legal background and through increasing recognition and support by the Party and Government, the private SMEs sector contributed remarkably to the economic development of Viet Nam. In the 1990s several economic and legal reforms and institutional restructuring programs were initiated to support SME development in Viet Nam (see Box 2.1).

[17] Cf. Dasgupta (2000), Romijn, 2001; Thiruchelvam et al., 2003.

[18] These included the following: Land Law (1988), Law on Foreign Direct Investment (1988), the Company Law and the Law on Private Enterprises (1990), Law on Export and Import Taxes (1992), Ordinance on Land and Housing Taxes (1992), Amended and Supplemented Law on Export and Import Taxes (1993), Law on Revenue Tax (1993), Amended and Supplemented Law on Special Consumption Tax (1993), Law on Agricultural Land Use Tax (1993), Law on Land (1993), The Labour Code (1993), Law on Bankruptcy (1994), Law on Tax on Transfer of the Right for Land Use (1994), Law on Domestic Investment Promotion (1994), Amended Company Law (1994), Amended Law on Private Enterprise (1994), The Civil Code (1995), Law on State Owned Enterprise (1995), Budget Law (1996), and the Commercial Law (1997).

Box 2.1. Economic, legal and institutional restructuring programmes to support SMEs

June 20, 1998: the Government issued Document 681/CP-KTN which formally defines SMEs as noted above and calls for the Ministry of Planning and Investment in co-operation with other agencies, sectors and localities to draw up draft strategies for SME development.

May 31, 1999: the Prime Minister's Research Commission (PMRC) on SME Promotion Policy, chaired by MPI, was established.

June 22, 1999: approval of the Enterprise Law on (replacing the Company Law and the Law on Private Enterprise) which took effect as of 1 January 2000.
November 23, 2001: Government Decree No. 90/2001/ND-CP on Support for Development of SMEs.

March 18, 2002: Resolution No. 14-NQ/TW of the Party's Central Executive Committee "Continuation of Renovating Policies and Mechanisms to Promote and Facilitate Private Sector Development". The Party has reaffirmed the commitment to developing the private sector, saying, "it is an important part of the socialist-oriented market economy in Viet Nam".

May 21, 2002: The Prime Minister approved the Comprehensive Poverty Reduction and Growth Strategy (CPRGS) that calls for the "building of capacity for organizations at the central and local levels in charge of managing and supporting SMEs... and development of specific policies in creating a supportive environment..."

Mid 2002: the Government launched an action plan 2002-2005 to implement the Resolution of the 9th National Congress of the Party: the action plan for the encouragement and facilitation of the cooperatives (those under the Cooperatives Law) and private economic sectors (those under the Enterprise Law).

May 2003: In the report by the Government to the National Assembly, private sector promotion and SMEs, particularly those in rural areas, have been highlighted as a priority area of the Government to ensure economic growth.

(Source: UNIDO, MPI)

The Government Decree No.90/2001/ND-CP further laid the foundation for a comprehensive support to develop the sector (see Box 2.2).

Box 2.2 Government Decree No. 90/2001/ND-CP on Support for Development of SMEs

The Decree defines SMEs as independent production and business establishments, which are registered according to the current legal provisions, each with registered capital not exceeding VND 10 billion or annual labor not exceeding 300 people. Enterprises set up and operating under the Enterprise, the State Enterprise and Cooperatives Laws and business households registered under the Government Decree No. 02/2000/ND-CP of February 3, 2000 are considered as SMEs.

Decree No. 90 provides the framework within which the Government plans to support and encourage SMEs in Viet Nam. The main elements are: encouragement of investments by SMEs through financial measures, including the setting up of a credit guarantee fund for SMEs; the setting up of industrial parks and production sites for SMEs; enabling SMEs to take part in government procurement programs; the promotion of subcontracting, partnerships, and exports from SMEs; the facilitation of business development services (information, consultancy, training, market access, technical services and trade promotion services, etc.) for SMEs to improve their competitiveness; and the encouragement provided towards the setting up of enterprise associations to represent and provide services for SMEs.

Decree No. 90 also provides the mandate for the establishment of the Department for SME Development (DSMED) as a semi-autonomous General Department directly under the Minister of MPI and the SME Development Promotion Council as an advisory body to the Prime Minister of Viet Nam and three Technical Support Centers, under the DSMED, in Ha Noi, Da Nang and Ho Chi Minh City.

(Source: UNIDO, MPI)

Moreover, the Government actively encourages an equitization programme. Although, in 2003, the economy is still dominated by the state sector, which accounted for 29.3% of output comparing with 27.58% of non-state sector (Table 2.5), it should be recognized that the industrial output value of the private sector increased 9.7 times during 1996-2003, compared to 2.4 times for the state-owned sector during the same period.

Table 2.5 Industrial output value at current price from 1996 to 2003 by ownership *(Billion VND)*

	1996	1997	2000	2001	2002	2003
TOTAL	**149,432.5**	**180,428.9**	**336,100.3**	**395,809.2**	**476,350.0**	**620,067.7**
State-owned sector	**74,161.1**	**85,290.3**	**114,799.9**	**124,379.7**	**149,651.5**	**181,675.3**
Central	49,493.4	56,862.7	78,586.5	85,947.4	104,626.7	129,007.2
Local	24,667.7	28,427.6	36,213.4	38,432.3	45,024.8	52,668.1
Non-State sector	**35,682.2**	**42,750.9**	**82,499.1**	**107,020.6**	**128,389.9**	**171,036.6**
Collective	836.4	970.5	2,165.6	2,162.0	2,727.0	2,745.8
Private	11,758.3	16,472.8	47,861.1	64,608.0	79,402.7	114,277.0
Households	23,087.5	25,307.6	32,472.4	40,250.6	46,260.2	54,013.8
Foreign invested sector	**39,589.2**	**52,387.7**	**138,801.3**	**164,408.9**	**198,308.6**	**267,355.8**

(Source: General Statistical Office, 2005)

As presented in Part 1.2, SMEs are defined in Viet Nam as businesses and production establishments that have a registered capital of less than VND10 billion (about US$ 670,000) or an average number of annual permanent employees of less than 300, or both. According to the evaluation of the ADB (2004), it is estimated that more than 90% of all private enterprises are SMEs, while UNIDO$_{(a)}$ assessed that 95% of manufacturing enterprises can be labeled SMEs. The majority of registered enterprises employ between 5 and 50 regular workers; altogether, 80% of enterprises count less than 50 workers.

Table 2.6 presents the sector's economic activities. SMEs form the majority of enterprises engaged in most fields of economic activities. They are mainly concentrated in seven fields of manufacturing, ranging from 73% to 93% of all enterprises in those sub-categories (and an average of 81%). The share of production output of SMEs in these seven sub-categories are ranked in ascending order, as follows: Food and beverage: 40.2%; non-metallic mineral products: 14.5%; wood processing and production of products from wood, bamboo: 8.1%; production of bed, wardrobe, and other furniture: 5.3%; production of metallic products (excluding machinery and equipment): 4.6%; textiles: 4.1%; and clothing, tanning, and dying: 4.1% (cf. CIEM, 1999).

Table 2.6 Profiles of the small and medium-sized enterprise sector

Item	1998		2000		2002	
	N	%	N	%	N	%
Total Number of Large Firms (+VND10 billion)	1,064	—	1,746	—	3,267	—
Total Number of SMEs (-VND10 billion)	**32,651**	**100.0**	**50,425**	**100.0**	**84,371**	**100.0**
SMEs with Less than VND1 Billion in capital	24,686	75.6	36,135	71.7	55,231	65.5
SMEs with VND 1-5 Billion in capital	6,341	19.4	11,376	22.5	23,205	27.5
SMEs with VND 5-10 Billion in capital	1,624	5.0	2,914	5.8	5,935	7.0
Total Number of Large Firms (+300 employees)	1,363	—	1,743	—	2,469	—
Total Number of SMEs (-300 employees)	**28,901**	**100.0**	**45,160**	**100.0**	**76,395**	**100.0**
SMEs with Less than 100 Employees	24,247	83.9	38,171	84.5	64,822	84.9
SMEs with 100-200 Employees	3,496	12.1	5,279	11.7	8,809	11.5
SMEs with 200-300 Employees	1,158	4.0	1,710	3.8	2,764	3.6
SMEs by Sector (based on capital)	**32,651**	**100.0**	**50,423**	**100.0**	**84,371**	**100.0**
Agriculture, Forestry, and Fishery	2,453	7.5	3,273	6.5	4,903	5.8
Industry and Construction	11,867	36.3	18,211	36.1	32,218	38.2
Services and Commerce	15,642	47.9	24,806	49.2	39,985	47.4
Others	2,688	8.2	4,133	8.2	7,265	8.6

Note: - = no data available

(Source: ADB, 2004)

As more SMEs enter the formal sector, tax revenues rise and provide the Government with greater budgetary resources that can partly be used to improve social services. Moreover, also in Viet Nam SMEs are major sources of employment creation: SMEs already employ almost half (49%) of the non-agricultural labour force in the country and are the fastest growing new enterprises in terms of number of employees. In some parts of the country, SMEs employ a majority of the non-agricultural work force. In the key field of manufacturing, SMEs employ 355,000 employees, some 36% of the total industrial labour force. In this sector, simple averages show that a small enterprise has about 16 employees, a medium enterprise about 102 employees.[19]

In view of the growing importance of SMEs in the country's economy and their potential, the Government's decision to design strategies for SME development per Document 681/CP-KTN and Decree 90/2001 is understandable.

[19] General Statistic Office, 1997. Some major indicators on the capital size and efficiency of 1.9 million production and business units in Viet Nam. Statistical Publishing House, Ha Noi, Table 4, pp. 16-39 and Table 5, pp. 40-51.

2.4.2. Constraints and problems faced by Vietnamese SMEs

A number of constraints of SME development in Viet Nam are mentioned in various studies (cf. GTZ, 2005; ADB, 2004; UNIDO, 2004).

Firstly, land is a critical factor that entrepreneurs have to consider in establishing an enterprise. Enterprises face a number of problems with respect to land: (1) Land regulation and planning is not transparent; (2) issuance of land use right certificate is very slow. Without such certificate enterprises cannot exercise their rights as defined by the Land law; (3) there exist difficulties in obtaining land use allocations or land lease; and (4) it is almost impossible for private firms to rent land from the Government.

Secondly, a SME development policy and coordination framework is absent. Although important progress has been made, the basic framework to support SME development is still incomplete, with regard to both policies and institutions. This lack of policy and coordination framework has resulted in contradictions and duplications in support programmes provided by different Government ministries and agencies. At provincial level, many policies and regulations issued by the Central government are not (yet) implemented consistently, and thus many laws and regulations have not been fully and effectively enforced.

Thirdly, there is limited access to financial resources for SMEs. While investment capital in SMEs is very low, they meet difficulties in accessing short, medium or long-term credits from banks and other credit institutions. Guaranteed loans are rarely provided to SMEs. Viet Nam's financial sector still perceives financing SMEs to be costly and highly risky. For reducing the costs and risks related to giving credit to SMEs, the following issues should be considered. First, recognizing that offering collateral[20] remains an important means for SMEs to access credit, the limited access to land-use rights certificates for use as collateral must be overcome. Second, lack of collateral is compounded by lack of financial information on SMEs in terms of business track records and audited financial statements. The financial reporting requirements are overly complex for SMEs. However, it should be recognized that the issues identified above are based on fundamental and structural impediments that confront the Vietnamese economy today: (1) The lack of basic economic and business infrastructure required for efficient functioning of a market-based economy (for instance accounting standards); (2) the bias toward State Owned Enterprises (SOEs) causes market distortions, often creating competitive disadvantages for private sector SMEs. Although recently, governmental policy directions have insisted that all enterprises should be treated equally.

Fourthly, there is limited access to international markets due to technical standards. Entering the World Trade Organization (WTO) regime, Vietnamese SMEs will have to make greater efforts to overcome the various technical standards of foreign law. Their products so far do not adhere to international quality, nor to environmental and social standards. At the same time branch associations and research institutes lack the

[20] *'Collateral'* hereafter means "property or other goods that you promise to give someone if you cannot pay back the money they lend you [= security]" (source: Longman Dictionary).

capacity to support enterprises to enable them to meet the requirements of the world market.

Fifthly, most production technology utilised by Vietnamese SMEs is backward and obsolete. The technology level across SMEs is generally assessed as being two, three or even more generations behind compared to regional and world technologies.

Lastly, training and management skills in SMEs are very low, related to the required demand, while limited provision of important information from and to SMEs is a significant barrier to SME development.

As a result, the contribution of SMEs to the economic growth of Viet Nam, to export and to the generation of labour and income is not in line with its potential.

2.5 ENVIRONMENTAL IMPACT FROM SMEs

In regard to the significant contribution of SMEs to the economy of countries around the world, it is surprising that there are so few quantitative data available to determine the environmental impacts of SMEs precisely. A recent study in six European Union countries, affirms: "it is still the case that relatively little is known about the contribution of SMEs to pollution and waste, although it is clear that they do make a very considerable collective contribution" (cf. UNIDO, 2002; Bezanson et al., 2000). One of the reasons of that shortcoming is that the heterogeneous nature of SMEs makes it difficult to identify the environmental impact of this sector.

It has been estimated that SMEs collectively could account for as much as 70% of all industrial pollution. Although this figure has gained a mythical status, it is quoted widely (cf. Hillary, 2000; Groundwork (1995): Tilley, 1999).

Based on the characteristics of SMEs such as using obsolete technologies, using inputs relatively inefficiency, lack of awareness with legislation, lack of pollution control facilities, as well as based on the location of SMEs, in general located in or nearby residential areas, many authors (Blackman, 2000; Hillary, 2000; Tilley, 1999; Frijns, 1997) suggested that the cumulative environmental impact of SMEs as a whole could be quite considerable and should not be ignored.

Certain types of SMEs can cause severe problems and thus received widespread attention in the literature (cf. Blackman, 2000; Scott, 1999; SMEC, 1999; Tilley, 1999; Frijns, 1997): leather tanning, electroplating, metal working, brick making, printing, wood processing, food processing, rubber, textiles and dyeing. They cause local pollution and nuisance by releasing harmful smoke, dust, bad smell, and toxic or hazardous matters into the air, soil and water bodies. They also contribute to more national and international environmental problems, for instance through air emissions (SO_2 and CO_2).

In addition, some general remarks about SME as opposed to large-scale industry can be derived from an Urban Management Program survey on small-scale and cottage industries in India, Mexico, Peru and Zimbabwe (Bartone and Benavides, 1993). First, SMEs are generally not the major polluters in their respective industrial sector, due to their small percentage of total output. Second, SMEs pollute more per unit of output due to their inefficient production, inferior equipment, poor housekeeping and

inability to adopt treatment technologies (due to lack of finance, space, experience and qualified operators). Third, SMEs cause local nuisance (including occupational health problems) due to their dispersed and residential location. Their location makes monitoring and finding common solutions difficult. These remarks have been confirmed by results from a recent study on the relationship linking income levels, distribution of plant sizes and industrial pollution in Brazil and Mexico (cf. Dasgupta et al., 2000): "plant size is inversely correlated with emissions intensity (emissions/output) in developing countries because of private-scale economies in pollution control and public-scale economies in regulatory monitoring and enforcement".

In short, the large number of SMEs and the wide dispersion of this sector suggest that they should be of high interest to organisations promoting more environmentally sound production.

2.6 ENVIRONMENTAL INSTITUTIONS AND LEGISLATION IN VIET NAM

Since the promulgation of the 1992 Constitution, the division of power in Viet Nam has been analyzed as a "triumvirate" of the Secretary-General of the Communist Party, the President and the Prime Minister. The General Secretary of the Communist Party has a very important role in policy formulation. The President is the Head of State, and leads the Office of State. The Prime Minister is the Head of the Government.

The National Assembly is the supreme law-making body which also elects senior governmental figures, including the President and the Prime Minister. Executive powers are vested largely in the Prime Minister, the Ministers and other officials of ministerial rank.

The structure of national governance comprises the central government in Ha Noi and subsidiary levels of government at the provincial, city, town and local levels. At the provincial level (there are 64 provinces, including the city municipalities of Ha Noi, Ho Chi Minh City, Hai Phong and Da Nang), the People's Committees are the effective organs which implement and enforce laws.

2.6.1 Environmental institutions at the national level

Environmental management in Viet Nam nowadays is administered on a national level by the Ministry of Natural Resources and Environment (MONRE). The environmental arm of MONRE, the Viet Nam Environmental Protection Agency (VEPA), is the body specifically tasked with the environmental protection mandate. Apart from MONRE, the various line Ministries have Science, Technology and Environment Divisions within their hierarchy. The Environment Divisions within those Ministries are entrusted with the environmental issues arising in the course of their respective Ministries' activities or jurisdiction. See Figure 2.1.

State agencies with environmental mandates

The Ministry of Science, Technology and Environment (MOSTE) was established in 1993. According to Law of Environmental Protection (LEP), MOSTE is the State management agency for environmental protection nation-wide.

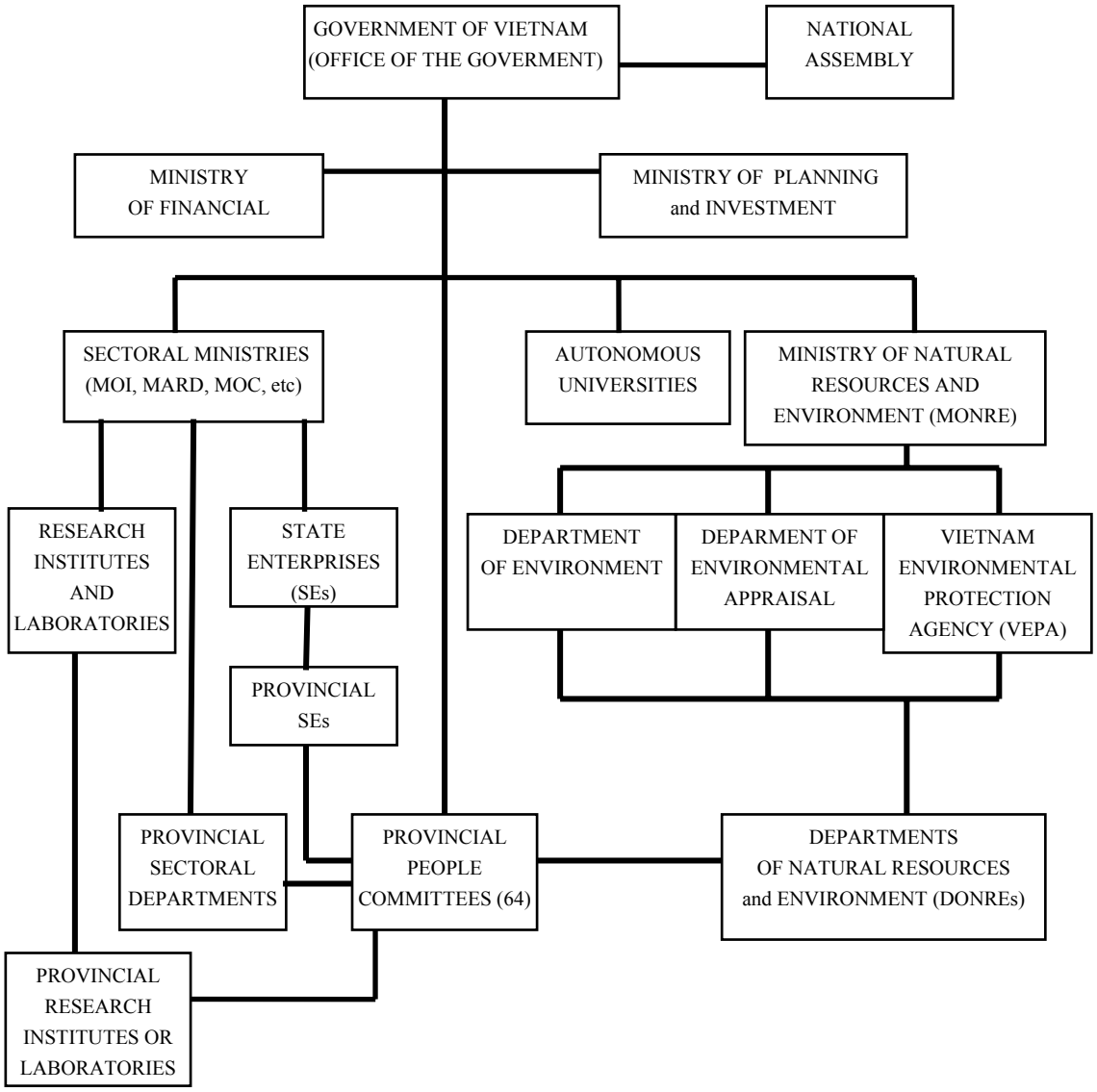


Figure 2.1 Institutional framework for environmental management in Viet Nam

In August 2002, the National Assembly ratified the establishment of the Ministry of Natural Resources and Environment (MONRE) in order to strengthen the State management on environment and natural resources. MONRE is composed out of departments that belonged to MOSTE combined with the General Department of Land Administration, the General Department of Meteorology and Hydrology, the Water Resource Management Agency (belonged to MARD), and Viet Nam's Geology and Minerals Agency (belonged to the Ministry of Industry-MOI). Although environmental duties among other ministries seem to overlap somewhere, administrative tasks related to MONRE cover various fields as following: (1) Land issues including registration, surveying, statistics, cartography, land-use planning, etc.; (2) water resources issues, including investigation, resources protection,

inspection, water resource license, etc.; (3) mineral resources issues including investigation, mineral resource license and registration for related activities, resources protection, etc.; (4) hydrology-meteorology including investigation and forecast; and (5) environmental issues, including appraisal of environmental assessment reports; organizing the environmental research system; establishing and managing environmental quality standards; organizing, establishing and managing environmental monitoring systems; guiding and inspecting line agencies and local authorities, organizations and individuals; formation of environmental management policy; organizing environmental inspections; and resolving complaints and notifications of violations in environmental protection within its authority.

The National Environmental Agency (NEA), which used to be a department of the old MOSTE, has been reformed into the Viet Nam Environmental Protection Agency (VEPA) of present MONRE. The major roles and responsibilities of VEPA are as follows: Formulation of national policies, strategies, legislation, regulations, and standards related to environmental protection; Ensuring that public and private sector organisations and individuals conform with environmental laws and regulations; data collection and management in co-operation with other state agencies in order to monitor the state of environment; preparation of annual national state of environmental report for submission to National Assembly; pollution management including control of industrial discharges; resolving environmental disputes and problems caused by environmental accidents; promotion of environmental awareness in co-operation with other state agencies; implementation of training programs for professional staff of VEPA and other central and local state agencies; and international co-operation on environmental protection.

VEPA has similar duties as NEA had, excluding the EIA-related tasks which are now managed separately by another department, the Division of Environmental Appraisal.

Line ministries related to several environmental management and protection activities

There are four relevant Ministries that perform environmental management and protection activities. The Ministry of Agriculture and Rural Development (MARD) performs functions of state management over agriculture, forestry and rural development. The Ministry of Construction (MOC) is responsible for the urban water supply and sanitation facilities. The Ministry of Industry (MOI) controls the environmental pollution and problems of state-owned enterprises. It also controls mining activities, which are recognized as one of the major pollution sources of Viet Nam. Finally the Ministry of Fishery (MOFI) is responsible for the management of both marine and inland fishery activities in the country. The principal environmental management tools used or proposed by these agencies include: environmental assessment, environmental appraisal of proposed investments and environmental inspections.

2.6.2 Environmental institutions at the provincial level

In line with the change of the Central Ministry (MOSTE to MONRE), the provincial Departments of Science, Technology and Environment (DOSTEs) have recently been

reformed to Departments of Natural Resources and Environment (DONREs). This reformation is combined with a new administrative structure, based on a merging of Departments for land administration and of environment, resulting in the establishment of 64 provincial DONREs in the whole country, with environment divisions at district level. Each DONRE is responsible for environmental management, land administration and mineral resources management within its locality.

Within DONREs, the environmental protection activities are carried out by one or more environment divisions. Just DONREs administrative matters and technical guidance fall under the purview of MONRE. For all other purposes, the DONREs operate under the direct authorization of the provincial governments, known as the People's Committees. With respect to the environment DONRE is responsible for: appraisal and assessment of the environmental impact of existing activities and new projects; resolving environmental disputes and problems caused by environmental incidents in the local area; pollution control including industrial discharges; training and community education on environmental protection; and monitoring environmental quality (air, water, soil, noise). The function, structure and size of provincial DONREs vary somewhat from province to province, depending on the size of each province, the development of local economy and industry, the priority given by the leadership and the public to environmental protection, etc.

In HCMC, DONRE is officially responsible for the management and improvement of environmental protection activities. DONRE HCMC consists of several sub-sections related to environmental management, such as the Environmental Management Division (EMD), Solid Waste Management Division, Water Resources and Mineral Management Division, HCMC Environmental Protection Agency (HEPA) and Urban Environment Company. At the district level, the Environmental Group belonging to the Division of Natural Resources and Environment is involved in implementing the environmental plans and programmes developed by DONRE and/or the District's People Committees.

The HCMC Export Processing and Industrial Zones Authority (HEPZA)[21] is responsible for pollution control of enterprises in industrial zones (IZs) and export processing zones (EPZs), under DONRE's professional support. On July 2, 2002, the HCMC People's Committee issued a regulation on environmental management in IZs and EPZs. Based on this regulation, HEPZA's responsibility and power are enhanced to effectively protect the environment in IZs and EPZs.

The structure of environmental management in HCMC is summarized in Figure 2.2.

[21] HEPZA is established according to Decree No. 731/TTg dated October 3rd, 1996 of Prime Minister of Government to be in charge of State management investment projects in EPZs and IZs. HEPZA has responsibilities and rights as follows: (1) Organizing, planning and managing to carry out the specific plan, developing and constructing schedule of EPZs and IZs; Supporting investment promotion activities into EPZs and IZs. (2) Accepting investment application; evaluating, granting and withdrawing investment license for investment projects which have the volume of capital up to 40 million US dollar; controlling the implementation of investment license. (3) Coordinating with other State administrative agencies on labor, service activities in EPZs and IZs. (4) Considering the leasing land cost, fees utilities with Developer Company, And (5) Granting, withdrawing other certificates under their authorization or to be authorized (Source: http://www.dpi.hochiminhcity.gov.vn/invest/html/hepza.htm)

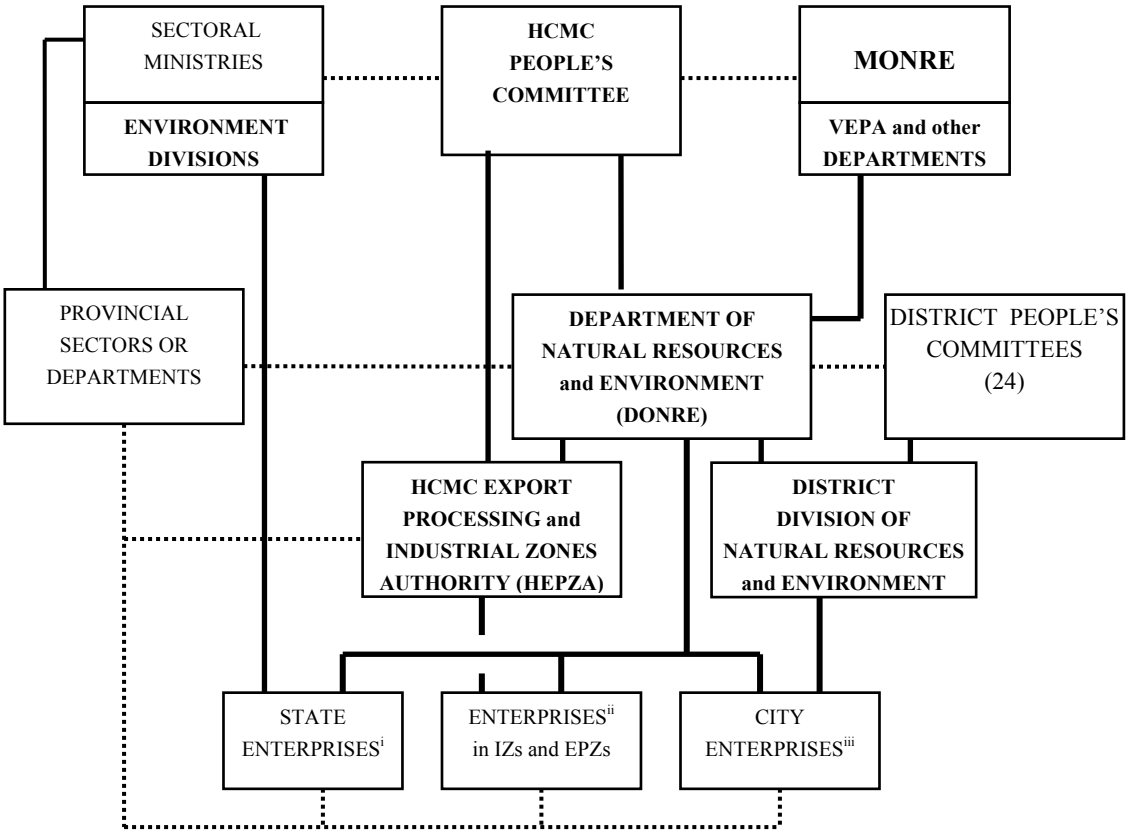


Figure 2.2 Institutional framework for environmental management in HCMC

Administrative Relationship
Collaborative and Supportive Relationship

Notes:

i – Enterprises including state-owned and collective sectors (see Part 1.2), most of them are large and medium-size. They are directly managed and permitted by Central organizations belonging sectoral ministries.

ii – Enterprises including state, private and foreign invested-sectors are administrated and permitted by HEPZA (see also Footnote 7).

iii – Enterprises (outside Export Processing Zones and Industrial Zones) including state, private and foreign invested-sectors are often small and medium-size. They are administrated and permitted by the City or District authorities.

2.6.3 Environmental legislations

The responsibilities for enacting legislation in Viet Nam are summarized in Table 2.7 In general, each legal instrument cited in this table spells out other legal instruments that are subordinate to it. If a legal instrument replaces earlier legislation, this is usually mentioned in the document itself.

Generally speaking, environmental legislations related to industrial pollution control can be identified in three main groups. Firstly, the basic legal framework for environmental protection is the Law on Environmental Protection (LEP), which was adopted by the National Assembly in late 1993 and took effect in January 1994. The LEP was enacted to serve the long-term and sustainable development of the nation and to aim at "preserving a healthy, clean and beautiful environment, improving the environment, ensuring ecological balance, preventing and overcoming adverse impacts of man and nature on the environment, making a rational and economical

exploitation and utilisation of natural resources". The LEP applies to all kind of economic facilities in Viet Nam, large and small, national and foreign.

Table 2.7 Legislative responsibilities at various levels of Government

Legislative body	Legislative instruments	Comments
National Assembly	1. Laws 2. Resolutions	Highest form of legal instrument in Viet Nam
Standing Committee of the National Assembly	1. Ordinances	Passed when National Assembly is not in session
Government	1. Decrees 2. Decisions 3. Regulations	Generally used to implement Laws and Ordinances, providing additional details
Ministries Offices equivalent to Ministries Offices belonging to the Government	1. Decisions 2. Instructions 3. Circulars	Provide guidance on how a particular Ministry will administer Laws, Ordinances, Decrees and Regulations
People's Committees at the: (a) provincial level (b) district level (c) commune level	1. Decisions 2. Instructions at the: (a) provincial level (b) district level (c) commune level	

(Source: UNDP, 1995)

The second legal group consists of regulatory documents that are issued by the Government, such as decrees, decisions and regulations. They instruct concretely how to implement as well as operationalize LEP. In November 1994, the Government issued Decree 175/CP on "Guidance for the Implementation of the Law on Environmental Protection". This is an important decree as it has detailed stipulations for the implementation of LEP. The decree contains chapters on the distribution of responsibilities of state management on environmental protection, on the assessment of environmental impact, on preventing, resisting and overcoming environmental deterioration, pollution and incidents, on financial sources for the task of environmental protection, on the inspection of environmental protection, and on provisions for implementation. Decree 26/CP (dated 26 April 1996)[22] provides regulations on administrative punishment for violation of the LEP.

The third group are regulatory documents issued by ministries and provincial governments, such as standards, regulations, rules, directives and circulars. For instance, MOSTE (and MONRE) issued various national environmental standards of

[22] Decree 26/CP was revised and named as Decree 121/2004/ND-CP dated 12 May 2004.

Viet Nam (TCVN 1995 and TCVN 2001) and circular No. 490/1998/TT-BKHCNMT (dated April 1998) that provides the guidelines on how to carry out and approve Environmental Impact Assessment (EIA) reports for new investment projects.

Other important decrees, regulations, circulars are listed in Box 2.3

Box 2.3 Major legislations in environmental protection and management in Viet Nam

Law on Protection of People's Health (1989); Law on Forest protection and development (1991); Law on Petroleum (1996); Mineral resource Law (1996); Law on Water Resource (1998); Law on Land (2003); Law on Fisheries (2003).

Decree No. 02/CP on Toxic Chemicals and Radioactive Substances (1995); Decree No. 42/CP on Promulgating Regulations for Investment and Construction Management (1996); Decision No. 155/1999/QD-Ttg on Regulations on Hazardous Waste Management; Decree No. 19/2001/ND-CP on Administrative Punishment for Violation of Radiation Control and Safety; Decree No. 106/2003/ND-CP on Administrative Punishment for Violation of Fee and Charge Regulation; Decree No.109/2003/ND-CP on Conservation and Development of Wetland; Decree No. 67/2003/ND-CP on Wastewater Fee.

TCVN 5937:1995 Air quality - Ambient air quality standards; TCVN 5938:1995 Air quality - Maximum allowable concentration of hazardous substances in ambient air; TCVN 5942:1995 Water quality - Surface water quality standard; TCVN 5944:1995 Ground water quality standard; TCVN 5945:1995 Industrial waste water-Discharge standards; TCVN 6772:2000 Water quality – Domestic wastewater standards; TCVN 6980:2001 Water quality – Standards for industrial effluents discharged into rivers using for domestic water supply; TCVN 6984:2001: Water quality – Standards for in Water quality – Standards for industrial effluents discharged into rivers using for protection of aquatic life.

Being in line with international developments, the laws and regulations promulgated by the Vietnamese Government seem to be sufficient to provide a good base for the protection of the environment in Viet Nam. However, the main difficulty with the present scheme of environmental protection legislation is the lack of knowledge, co-ordination, and consistency in implementing the various provisions of this legislation (cf. UNDP, 1995; Frijns et al., 2000; Phung, 2002). The causes for this poor implementation and enforcement are a lack of man-power, specific knowledge, technologies and instruments. For example, an important condition for environmental protection is an effective monitoring system, which is necessary for controlling the activities of manufacturers and polluters, and revaluating (providing feedback) the effectiveness of standards, strategies and policies of the government. However, effective monitoring of emissions and environmental quality is lacking.

Another shortcoming in the current environmental management system in Viet Nam is the marginal role of the public (as well as NGOs) within the policy setting and regulatory activities of authorities (cf. O'Rourke, 2004). Environmental management and industrial pollution control could certainly be enhanced through public participation in monitoring as well as in the formulation and implementation of national and local environmental plans. Not only can participatory strategies assist in the gathering of environmental information and its evaluation, but they can also assist in reducing the costs of implementation and in putting pressure on polluters to clean-up their facilities (cf. UNDP, 1995; O'Rourke, 2004).

The environmental standards and enforcement measures of MOSTE and MONRE seem at times maladjusted to the specificities, needs and situations of Vietnamese industries. For instance, when facing difficulties in meeting environmental standards (due to high treatment cost, lack of know-how, etc.) enterprises often neglect the requirements of environmental authorities and accept the risk to pay fines. The fines are always lesser than the investment and treatment costs and the chance of actually having to pay is rather small. In addition, economic instruments are hardly used. Many environmental values or valuable raw materials have not yet been priced or are priced too low, resulting in inefficient use. It is exactly these often quoted problems of ill-fitting environmental policies that will be addressed and evaluated more systematically in this thesis (see Part 1.5 and 1.6).

3. ECOLOGICAL MODERNIZATION AND THE ROLE OF THE STATE

3.1 THE EMERGENCE OF ECOLOGICAL MODERNIZATION THEORY

The history of environmental concern in the Western industrial societies is generally divided into three different waves[23]. The first wave mainly focused on the degradation of natural landscapes due to increasing industrialization and urbanization at the beginning of the twentieth century. It concentrated on how valuable nature areas and endangered species can be protected against the devastating influence of modernization.

The second wave of environmental concern, starting in the 1960s and maturing in the 1970s, focused on what is now often called the grey environment. Environmentalists called for a fundamental reorganization of the social structure as the only possibility to move to an ecologically sound society. According to Mol (1997), among its most significant successes were the creation of government departments for the environment in most of the industrialized societies, an expanding environmental legislation and planning, and a rapid increase in the number and membership of non-governmental organizations. Although there were differences between nations in the speed and structure of environmental policy responses, these policies had some basic characteristics in common, such as: the idea of a trade-off between economic development and environmental protection; a strong orientation on the nation state and lacking a clear international perspective; the establishment of specific governmental agencies charged with environmental protection rather than integrating the environment in all governmental agencies; and the application of add-on techniques and stipulating pollution control regulations (Weale, 1992). Typical milestones of this second wave were the Limits to Growth report (1972) and the United Nations Conference on the Human Environment (Stockholm 1972).

The third upsurge emerged in the late 1980s and early 1990s. The Brundtland report (WECD, 1987) and the United Nations Conference on Environment and Development (Rio de Janeiro 1992) are often cited as the milestones of this third wave (Mol, 1997). This third wave witnessed some major changes in the environmental policies of many Western countries. The environmental agenda was no longer limited to a national level, but had broadened to an international level. At the same time cross-media control systems and integrated pollution control began to emerge in environmental policies. With respect to technology, the pollution prevention at source started to be emphasized and preferred widely[24]. Learning from implementation failures and deficits of traditional models of regulation, economic-based approaches were encouraged and increasingly implemented in pollution control, next to social and information instruments. The increasing role of the public was recognized in setting

[23] On the literature, it is divided into two or three depending on the authors' historical opinions (cf. Mol, 1997).

[24] In fact, the precautionary principle was recognized by the EU in 1993 through a statement from Maastricht Treaty "Community policy on the environment should be based on the precautionary principles and on the principles that preventive actions should be taken, that environmental damages should as a priority be rectified at source and that the polluters shall pay" (Tickner and Raffensperger, 2001). It was also included on the Rio Declaration and the Biodiversity Convention, in 1992.

up and supervising environmental policy implementation (Weale, 1992). Besides, developing countries witnessed the establishment of environmental ministries, national institutions, environmental laws and regulations and environmental NGOs during this third wave.

Ecological Modernization theory has emerged against the historical background of this third wave, trying to interpret and understand the historical development and transformations that took place in modern societies when they struggled to deal with environmental challenges during the third wave. From its emergence in the late 1980s, ecological modernization theory has developed into a mature theory and one of the leading perspectives in environmental sociology (Mol, 1995; Mol and Sonnenfeld, 2000; Spaargaren, 2000). The historical development of Ecological Modernization theory can be summarized in three chronological phases (Mol, 1999; Mol and Sonnenfeld, 2000). Initially, Huber (1982; 1985 in Mol, 1995) - one of the founding fathers of this perspective - especially emphasized the role of technological innovations, mainly in the sphere of industrial production, criticized the bureaucratic state and favored market dynamics, instruments, and actors in environmental protection. From the late 1980s onward, the second phase gave the institutional and cultural dynamics of ecological modernization processes a more central place (cf. Cohen, 2000). In both phases the emphasis and empirical background was very much on North-western Europe. From the mid 1990s onward, Ecological Modernization theory was broadened to other countries. At the same time the emphasis on the production sectors was completed by studying transformations in the consumption sphere (Mol and Sonnenfeld, 2000; Spaargaren, 2000). Nowadays, growing attention is moved to the international and global dynamics of ecological modernization (cf. Mol, 2001).

3.2 CORE FEATURES OF ECOLOGICAL MODERNIZATION THEORY

To understand the idea of ecological modernization it is necessary to elaborate on the concept of ‘modernization’. Modernization used to be a heavily contested concept, especially in its framing by the post-war modernization theories in the 1950 and Parsonian functionalism. Modernization had a strongly normative undertone then, referring to the end of an evolutionary development trajectory (such as Rostow’s five stages of economic development), where the United States (of America) model of development was seen as the logical end-stage for all countries. Dependencia-scholars and World-System theorists were among the fiercest critics of the normative undertones of such a simple model. While heavily debated in the 1960s and 1970s, the concept of modernization seems to be less controversial today. Relieved from its normative, U.S. focused undertones, modernization is increasingly used by major social scientists (such as Anthony Giddens, Ulrich Beck, John Urry) to refer to the inherently modern character of the present, be it that the current phase of a second, reflexive, global, late or ecological modernity differs substantially and fundamentally from the simple or first modernity of the post-war years.

According to Huber (1991, in Mol, 1995), "modernization is a social process which mainly relies on the modern institutions of science -or science and technology-, on the market economy, on money and credit economy, on modern state building -or modern administration-, on modern law (public or private), and on an ethic of individualism (activity and pursuit of happiness revolving around individual activity and individual responsibility)". Ecological modernization characterizes then the 'socio-ecological change' taking place from the 1980s (Seippel, 2000), whereby these modern dimensions and institutions are ecologically restructured, but keep their 'modern' outlook. Ecological modernization can thus be interpreted as the ecological restructuring of processes of production and consumption under conditions of and using modern institutions. It suggests increasing evidence for the fact that all economic activities are to be considered, judged and designed not only from an economic perspective, but also from an ecological one. As such ecological modernization departs from the longstanding perspective of a necessary trade-off between economic development and environmental protection (which was central in the second wave of environmental concern during then 1970s), and comes in line with Brundtland's ideas of sustainable development.

Building upon this, Mol (1997[a]) has summarized the core features of ecological modernization under four characteristics.[25] First, ecological modernization theory identifies modern science and technology as central institutions for ecological reform, and not so much as only a cause for environmental disruption. Science and technology are principal institutions for *ecologizing* the economy (Mol, 1997[a]). But in doing so, a transformation is needed (and taking place) from first generation environmental technologies (end-of-pipe or add-on and clean up technologies) to second generation ones (process-integrated, prevention technologies, cleaner production, industrial ecology).

Secondly, ecological modernization theory emphasizes the role of economic agents and market dynamics in ecological reform. Economic development and ecological quality are interdependent, but not antipodal or incompatible in a simple mono-causal way, as has been proclaimed in the 1970s (Mol, 1995). Ecological modernization theory confirms that the market and economic agents such as producers (polluters), credit institutions, insurance companies, business associations, consumers, customers, and utility companies increasingly share tasks and responsibilities in environmental reform, in addition to the conventional role and responsibility of the state. Recently, beside state agencies and social movements, these economic actors and institutions have increasingly started to turn into social carriers of ecological restructuring, innovation and reform, both within countries and across borders (Mol, 2003[b]). We see that for instance in environmental certification of production, such as ISO 14000 or Environmental Management System (EMS), and in eco-labelling of products.

A third characteristic of the ecological modernization theory relates to the transformation in the role of nation-state. At an earlier stage than the present movement put together under the shift from 'government' to 'governance', ecological modernization theory already analyzed that the role of the state in environmental

[25] In recent literature, Mol and Sonnenfeld (2000) introduced a supplementary characteristic 'Changing discursive practices and emerging new ideologies' in the core features of ecological modernization. It states that "complete neglect of the environment and the fundamental counter positioning of economic and environmental interests are no longer accepted as legitimate positions".

policy changes from a curative and reactive to a preventive mode, from 'closed' policy-making to participate policy-making, from centralized to decentralized, and from dirigistic to contextually 'steering' (Arts and van Tatenhove, 2004; Mol, 1997[a]). These developments are often put together under the heading of political modernization, pointing at dynamics that imply new relationships between state-industry and state-non governmental actors, with more decentralized, flexible and consensus-oriented governance styles and less top-down, national command-and-control environmental regulation. In addition, Mol (2003[b]) recognized that international and supra-national institutions have an emerging role that significantly changes the sovereign role of the nation-state in environmental reform.

Fourthly and finally, ecological modernization theory reconceptualizes the position and role of social movements in the process of ecological transformation. Accompanying the institutionalization of the environment in state, market and technological developments as well as institutions, environmental movements have transformed from an outside critic that only manages to influence the public agenda, towards a more active participant and practitioner in public and private decision-making institutions regarding environmental reforms (Mol, 2000; Mol and Sonnenfeld, 2000).

Using these four heuristics, numerous empirical studies have illustrated that processes of ecological modernization are taking place to some extent in the industrial countries, also outside the north—west European context (cf. Mol and Sonnenfeld, 2000). Whether a similar process is taking place in developing countries remains unanswered. Mol (1995:54) stated that: "the ecological modernization theory is based on certain presumptions which do not always apply to these developing regions, e.g., the existence of a welfare state, advanced technological development in a highly industrialized society, a state regulated market economy (...) and relatively profound and widespread environmental consciousness". In a later publication repeated and amplified with "the institutional characteristics that were essential for the process of ecological restructuring in industrialized countries will only be partly met in most developing countries" (Mol, 1997[b]). Evidence and empirical 'verification' of the (limited), possibly limited, usefulness of ecological modernization frames to study environmental restructuring in developing countries are still scarce.

In this research, the ecological modernization theory will be applied as a theoretical framework to analyze the environmental policy in Viet Nam, and therefore the research will contribute to the geographical scope questions of the theory (cf. Mol, 1995; Mol and Sonnenfeld, 2000). In doing so, the third core feature or heuristic of ecological modernization theory, that on *political modernization*, takes a central place. Political modernization is used to analyze and understand the changing role of state in transforming environmental policy from a mere command-and-control regulation towards more negotiating, enabling and facilitating strategies. But this political modernization hypothesis can only be understood against the background of the wider framework of ecological modernization.

3.3 POLITICAL MODERNIZATION - THE ROLE OF THE STATE IN ENVIRONMENTAL REFORM

As introduced, ecological modernization discusses the transformation in the role of nation-states as political modernization or modernization of conventional politics[26]. In general, political modernization expresses the changing relations between state, market and civil society in various stages of the institutionalization of environmental politics. Political modernization is critical towards, and deviates from, the central, monopolistic role of a strong bureaucratic state in market and other societal activities. But it does not deny the state's indispensable role in environmental management, strongly related to the public good character of the environment. Hogenboom, Mol and Spaargaren (2000) affirm that political modernization entails two main transformations of the state's role in environmental politics. First, the tasks and responsibilities of the state and the incentives for environmental restructuring and reform are partly shifted to the market. Given that, economic mechanisms and institutions (such as ecological taxation, levies, value-added differentiation, and charges) as well as various economic actors are activated, re-designed and put to work in obtaining less pollution and a more efficient use of natural resources. Secondly, state governing changes from 'closed' to participatory policy making, from centralized to decentralized institutions, and from dirigistic to reflexive governance[27]. The focus is more on establishing favorable conditions for environmental reform by polluters, than on prescribing the exact formula's to achieve such improvements. Hence a change from a gardener state to a gamekeeper state, as Bauman (1987) has illustrated.

Van Tatenhove and Leroy (2003) use Alexander (1995) to distinguish the dynamics of the process of political modernization in three phases: early-, anti-, and late-modernization *Early-modernization* believes optimistically on the state's capacity to solve social problems by rational policy making and comprehensive planning. In contrast, *anti-modernization* is doubtful about the scientific optimism, and emphasizes the constraints of rationality. It reacts to the unsolved 'reality problems' of the modern society. The anti-modernization's discourse was launched by new social movements from the late 1960s and early 1970s. The discourse shows the opposition of civil society to what was regarded as a malicious state-market coalition, especially to the oppressing role of the state. *Late-modernization*, as Beck (1994, 1996 in van Tatenhove and Leroy, 2003) stated, reflects the emergence of the 'risk society' and the evidence that the side-effects of modernization have become the pivot of governance, where the state can no longer regulate the risks properly. Some modern risks can only be dealt with through the politicization within other spheres of society. Late-modernization assumes a variety of participatory, interactive and deliberative patterns and practices of policy making with increasing interweaveness of state, market and society.

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[26] In a broader meaning, the concept of political modernization refers to processes of transformation within the political domain of society. Hereby the political domain is the setting in which different organisations (from state, market and civil society) produce and distribute resources (power and domination) and meaning (discourses) to shape public life (Van Tatenhove and Leroy, 2003).

[27] Governance can be defined as the manner in which power is exercised in the management of a country's social and economic resources for development. Good governance thus involves all the three sectors-the state, private sector and civil society. The interplay between these three groups of stakeholders is critical for achieving balanced socio-economic development and nation building. (Source: ADB (1999) in World Bank, 2000).

Through lessons from European environmental policy (cf. Bulkeley and Mol (2003); van Tatenhove and Leroy (2003); Hogenboom, Mol and Spaargaren (2000)), there are three debates emerging regarding processes of political modernization. The first debate focuses on the environmental effectiveness of these transitions in policy making: does political modernization really lead to better environmental performances and thus solve the problems of state failure that were at the source of these innovations? The second debate focuses on the challenges that political modernization puts on the democratic qualities. When legislative and especially representative state organizations see their role diminishing in policy making processes, and environmental NGOs do not fill up the 'democratic gap', what are than the consequences for democracy of political modernization tendencies? Thirdly, political modernization might include a danger of a withering away of the central state in setting the agenda, standards, goals and long-term strategies for safeguarding environmental quality. As states have always been associated with the provision of public goods, debates have emerged to what extent environmental quality can be safeguarded without a central role of the nation-state.

3.4 POLITICAL MODERNIZATION IN PRACTICE

Although direct - or command-and-control - regulation still occupies an important place, other perspectives and practices on governance are gradually appearing in environmental policy. These new perspectives usually involve a larger role of private actors, either via intensive negotiation, consultation, interaction, and even self-regulation, or via increasing economic and market-oriented strategies and instruments (cf. Liefferink et al., 2000). Consequently, the role of the state itself changes following these innovations. A new co-operative, consensus-oriented relationship between the state and private actors is emerging. In other words, polycentric networks of actors appear in policy making and implementation, replacing the conventional hierarchic duality of state and society that dominated environmental policy for such a long time.

Thus in the practice of environmental policy the new approaches and developments in a political modernization context are (i) decentralization and (ii) privatization; (iii) the emergence of market-based responsibilities and instruments; (iv) the importance of negotiated responsibilities (agreements, covenants). This paragraph will subsequently elaborate on these four characteristics of 'political modernization in practice'.

From centralisation to decentralisation

Carter (2001: 41) defines decentralization as: "The expansion of local autonomy through the transfer of powers and responsibilities away from a national political and administrative body". Or as the UNDP (cf. Work, 2002) states: "Decentralizing governance is the restructuring of authority so that there is a system of co-responsibility between institutions of governance at the central, regional and local levels according to the principle of subsidiary, thus increasing the overall quality and effectiveness of the system of governance, while increasing the authority and capabilities of sub-national levels". Work (2002) distinguishes three broad types of decentralization (political, administrative and fiscal) and four major forms of decentralization (devolution, delegation, deconcentration and divestment). In this

study, administrative and political decentralization in the form of devolution will be mainly addressed, although at place other types and forms may be touched upon. Administrative and political decentralization normally refer to situations where political and administrative power and authority have been transferred to sub-national levels of government. Devolution refers to the full transfer of responsibility, decision-making, resources and revenue generation to a sub-national or local level public authority that is autonomous and relatively independent of the devolving authority.

According to Hardallul (2001) devolution of powers is expected to improve efficiency of service provision, reduce corruption and increase transparency. Administrative and political decentralization requires the restructuring of institutions and further developing linkages with society and business[28]. Ebel (1998)[29] mentions a large variety of reasons why decentralization seems to be a growing tendency all over the world: "The western world sees decentralization as alternative to provide public services in a more cost-effective way. Developing countries are pursing decentralization reforms to counter economic inefficiencies, macroeconomic instability, and ineffective governance. Post-communist transition countries are embracing decentralization as a natural step in the shift to market economies and democracy. Latin America is decentralizing as a result of political pressure to democratize. African states view decentralization as a path to national unity." [30] Similar kind of reasons and background can be found in the political and administrative decentralization in environmental policy and management. In practice, the environmental management responsibilities of cities and provincial governments often focus in several main areas such as sanitation, waste collection, environmental pollution control, and natural resources exploitation. Besides, they increasingly take up tasks related to environmental monitoring, environment impact assessment, environmental accident and risk management, environmental education and environmental planning and regulations.

Decentralized environmental management in developing countries relates to attempts to repair failures of the nation-state in environmental policy, which are often attributed to the concentration of decision making powers and ownership of natural resources by the central government, resulting in cost-inefficiencies, ineffectiveness and corruption. In general terms, decentralization of environmental management responsibilities aims to improve the provision of services related to (local) environmental problems and needs a better tailoring to the specific local circumstances. Vries et al. (2001) recognize several advantages of environmental decentralization: better cooperation between local actors in environmental management; better possibilities for community participation; better accountability of environmental service providers, because of a closer relationship with the users and beneficiaries. In addition, decentralized environmental management can also provide more local job opportunities.

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[28] Vries et al. (2001) suggest that through local financing and linking resources from different local sources, efficiency gains can be achieved.

[29] Ebel, R., "Logic of Decentralisation and Worldwide Overview", Talking Points. September 4, 1998 (cf. Work, 2002:5).

[30] In addition, Litvack et al. (1998) states that one reason why decentralisation has attracted so much attention is that it is often a cross-cutting reform that can relate to various concerns, such as fiscal and financial development; macro-economic stability; poverty alleviation and the social safety net; institutional capacity, corruption, and governance; investment infrastructure; and the provision of social services.

But, as with all tendencies, there are counter reactions and forces preventing such developments. Central authorities are often unwilling to cede power and various considerations are put forward that should constraint environmental decentralization: a lack of the capacity of local government to manage the additional resources and functions effectively[31]; the risk of unequal development between local areas (rich versus poor municipalities) with respect to resources and service levels; loss of financial control by the central government, and a risk of irresponsible fiscal practices; and a fragmentation of decision making about issues that need an integrated approach at higher levels or in other areas (cf. Vries et al., 2001). In addition, lack of transparency in the implementing process, lack of accountability in authorities, and the risk of corruption are likely serious concerns in decentralization process and in building modern governance, also in Viet Nam (cf. World Bank, 2000 and 2004). Ironically, we see partly the same arguments being used by those in favor of decentralization and those being critical of decentralization.

To secure the success of decentralization processes, there is a need for a gradual development, with adequate control and communication and a high priority for capacity building at the local levels[32]. Especially in developing countries such as Viet Nam, decentralization in environmental management should come along with a parallel upgrading and strengthening of the local institutional arrangements and human capacity, establishing lines of accountability for environmental protection and sufficient budgets transfer to carry out monitoring and enforcement. Only than can we expect decentralization to be a successful form of political modernization in practice.

Privatization as regulatory reform

The term "privatization" gained popularity and became widely known and cited in 1984, following the sale of British Telecom. Currently, in its widest sense it refers to all initiatives designed to increase the role of private enterprises in using society's resources and producing goods and services, and reduce or restrict the roles that governments or public authorities play in such matters. Privatization, deregulation and liberalization, which are different phenomena, often go together although it can sometimes cause confusion.[33]According to Von Weisäcker et al. (2005), there are four broad categorizes of privatization: (1) putting state monopolies into competition with private or other public operators; (2) outsourcing, in which governments pay private actors to provide public goods and services; (3) private financing in exchange for delegated management arrangements, often with a view to transferring ownership to the state after a period of profitable use (the 'build-operate-transfer'-BOT- contract belongs to this categorize); and (4) transfers of publicly owned assets into private hands.

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[31] Based on one of its investigations, the OECD (2000) stated that the most general constraint of decentralization is weak local authorities. The OECD also highlights how the nature of constraints differs according to the extent of decentralization and of the space given to civil society involvement in decentralized environmental management. With high level of decentralization, there is a tendency to ask too much of local communities. In addition, the unclear role and responsibilities will cause conflicts between different sectors and departments within governments, also because decentralization of nominal responsibilities often comes without concomitant powers or finances.

[32] World Bank (2004) states that the modernization of administrative capacity on the ground will represent an enormous effort, which will need to be actively supported by the central government.

[33] *Deregulation* means the removal or attenuation of restrictions, including requirements and prohibitions, imposed by a public authority on the actions of public or private actors or, in essence, any reduction of state control over the activities of societal actors. *Liberalization* can take a variety of forms, ranging from anti-trust measures to the elimination of subsidies and the introduction of incentives to stimulate competition between private actors (cf. Von Weisäcker et al, 2005)

Privatization is sometimes compared to a two-horse cart, one horse referring to *political goals* and moving flighty and fickle, and the other referring to *economics*, moving slowly and steady (Donaldson and Wagle, 1995). Driving such a cart is not a simple duty but needs a skillful driver who controls two horses synchronously and harmonically. In other words, privatization needs to balance economic and political goals. And the one universal requirement is that the privatization process should always be *transparent* to the public.

Privatization creates good results under some conditions and bad consequences under others. According to Von Weisäcker et al (2005), positive results of privatization include: improved economic performance and increased investments; better quality of services (especially in privatizing water and sanitation); saving taxpayers' money; innovation and capacity-building (by competition pressure); and orderly re-regulation (with especially a strong role of the state in protecting consumers, preventing environmental degradation, pursuing equity and social access). The World Bank (2004: ii) typically emphasizes the positive sides of privatization in its statement that "the transition to a market economy opens the possibility to diversify the suppliers of these services, bringing in the private sector and enhancing the range of choices available to the population". Beside this, privatization also has its dark sides: inadequate rules related to investments (due to weak and inexperienced negotiation of government with powerful international corporations); insufficient competition through private monopolies (due to lack of competition policies and anti-trust laws); 'cherry-picking' of the private firms and marginalization of the poor (due to a lack of social equity); shifting risks and externality costs to public and citizens (deficient contracts which dominated by experienced international companies); and fraudulent practices and corruption.

So far, privatization can be witnessed widely around the world in diverse activities. With respect to environmental management, privatizing tendencies emerge in various sectors. Firstly, we witness it in waste management and sanitation activities. Proponents of privatization claim that public waste management is inefficient and leads to high prices and low standards of customer service. The German and Malaysian experiences reveal that privatization and competition are beneficial only if they are embedded in a sensible framework of regulations in which monitoring and sanctions in case of non-compliance and corruption are in strong state hands (cf. Bleischwitz and Proske, 2005). In Viet Nam, the government has recently encouraged privatization in environmental service provision, using the term 'socialization'[34]. Private contractors for waste collection and septic tank emptying from household have been accepted in Lang Son, Da Nang and HCMC. HCMC also witnesses privatization projects and investments by domestic and foreign companies in waste treatment. Secondly, privatizing activities in natural resources management and exploitation such as water supply[35], forestation, and energy have developed in cities throughout the world, for instance in Cochabamba-Bolivia, Grenoble-France, Manila-Philippines, Dar es Salaam-Tanzania, Rostock-Germany, and California-USA (cf. Von Weisäcker

[34] Viet Nam's 1992 Constitution recognizes the freedom of business and equality, and states: "The aim of the State's economic policy is to make the people rich and the country strong by releasing all the productive potential and developing all the latent possibilities of all components of the economy- the state sector, the collective sector, the private individual sector, the private capitalist sector and the state capitalist sector in various forms".

[35] HCMC's government has encouraged and accepted private investment projects in water supply in Nha Be, Can Gio - suburb districts, where public water system has not yet been developed.

et al., 2005). Thirdly, privatization can be found in environmental quality monitoring in terms of operation and maintenance of instruments and stations (Hong Kong, Singapore and HCMC), of measuring, data handling and supervision, and of training and consultancy.[36]

In sum, privatization may be a good option in improving environmental management in some cases, while not in others. A healthy awareness of the limits to privatization is needed, rather than an unconditional approval or rejection (cf. Von Weisäcker et al., 2005). In order to enhance privatization, it is essential to develop good governance and transparency[37]; to build a clear and strong legal framework on privatization including enterprise law, anti-trust law and competition policies; to improve corporate governance responsibility; and to facilitate dialogues between the government, the private sector and civil society.

Command-and-control versus market-based instruments

Command-and-control approaches are often associated with the traditional environmental policy paradigm. These approaches can be feasible when we deal with a limited number of homogeneous polluters that can easily be identified. If this goes together with a strong regulatory agency, such approaches can even be quite cost-effective, precise, predictable and effective. However, command-and-control approaches are limited in situations with either heterogeneous polluters, a large informal sector especially with SMEs, or a weak public administration, or a lack of state capacity to monitor and enforce environmental laws and regulations. As most countries have an extensive system of environmental laws and regulations but by the same token still witness massive environmental problems, the use of regulation and command-and-control is criticized sharply, particularly by economists, industrialists and right-wing politicians (referring to the ineffectiveness, inefficiency and the 'regulatory burden')[38]. In response to the inefficiency of command-and-control as well as to reduce the regulatory burden for government, market-based instruments are often suggested as alternative. Market-based instruments provide an incentive for polluters to reduce their pollution in a cheaper, more cost-effective way than through laws and regulations. The growing interest in market-based instruments in environmental policy is one indicator of a general shift from a conventional paradigm towards ecological modernization, according to Carter (2001). It means a sharing of tasks and responsibilities in environmental reform between the state and politics and the market and economic agents (Mol, 1997; Sonnenfeld and Mol, 2002).

Market-based instruments are often based on the polluter pay principle (PPP): the idea - formulated by the OECD already in 1972 - that polluters have to pay for their pollution. There is a wide variety of market-based instruments, varying from more traditional ones (such as eco-taxes, levies, subsidies and deposit- refund systems), to more sophisticated and innovative ones (such as the bubble concept, tradable emission

[36] In HCMC, HEPA has signed annual contracts with private and public research institutes in measuring river water quality and hydrographical data in Dong Nai river's catchment area.

[37] According to ADB (1999), good governance needs to include four pillars: transparency, accountability, predictability, and participation (source: World Bank, 2000:116).

[38] cf. Carter, 2001.

permits)[39]. The flexibility of market-based instruments allow each polluter to decide whether to pay pollution charges/ecological tax or to undertake additional abatement or preventive measures, with the - theoretical - result that low-cost abatement is selected, since each polluter will abate only if the marginal costs of pollution prevention or abatement does not exceed the payments of the market-based instrument. In addition, there are other advantages of market based instruments mentioned. The raised revenues can be reinvested in environmental policies and measures; the use of environmental taxes to change polluters' behavior has high educative and communicative qualities; and the so-called 'double dividend', where a switch from labor taxes to environmental taxes would not only lead to lower levels of pollution but also to cheaper labor and thus less unemployment. Finally, Hogenboom et al. (2000: 97) point to the fact that "by utilizing market dynamics to promote environmental reform and by leaving less - albeit essential - elements of environmental policy-making to central (and localized) governmental bodies, the state is prevented from becoming an environmental Leviathan".

Regardless of these theoretical advantages, policies with market-based instruments have encountered many implementation difficulties. First, there is the difficulty of setting a tax at the correct level, in order to both stimulate polluters to reduce their pollution (change their behaviors) and without affecting their economic position and functioning drastically. The experimentally adjustment of a tax level takes time and can be costly. A second difficulty is related to the identification of the exact tax payments according to the pollution levels. Often detailed technical data need to be collected and the monitor of tax payment performance needs to be strict.

In their design and implementation process, market-based instruments also encounter several political obstacles. First, these instruments are often 'politically unpopular' or meet 'bureaucratic reservations'. Carter (2001: 300) states that "bureaucracies tend to be conservative institutions which prefer tried and trusted mechanisms such as regulations". But also companies often oppose or reject market-based instruments, as Carter (2001: 302) rightly recognizes: "in practice, the typical response of business is to resist any form of imposition on their activities, whether tax or regulation".[40] Second, there are ethical objections concerning the 'right of pollution' and the potential inequity between lower and higher income groups.

Given these obstacles of market-based instruments in developed countries, it should come as no surprise that the application of market-based instruments in the developing countries will not be easy. First, in developing countries the priority is strongly on economic development and the use of the economy for environmental purposes is not very popular. Second, developing countries lack resources (manpower, institutions, monitoring instruments), experiences and knowledge necessary for the

[39] In addition, market-based approaches which called as 'marketization' of environmental politics refer to the delegation of responsibilities and competencies towards either autonomous or privatised agencies (Van Tatenhove and Leroy, 2003). In environmental management fields which dominated by state agencies such as energy, water supply and waste management, private actors have more and more played important role.

[40] In HCMC - as well as elsewhere in Viet Nam - the City government has encountered strong reservations from businesses and sectoral associations when introducing an industrial wastewater fee collection in the end of 2004. These businesses were mainly worried because the fee was based on a complicated calculation of pollution load containing many different pollutants such as COD, BOD_5, SS and five heavy metals.

adequate implementation of market-based instruments. Besides, a strong legal bedrock and high public awareness are often missing.

Negotiated environmental agreements (NEAs) - Reflexive governance

Following the development towards growing complexity of social systems, the increasing need to adapt environmental programs to local circumstances in order to make them effective, and the necessity for flexibility in environmental planning and policy-making, governments have to change their environmental policy. Increasingly, the prescription of the means to improve environmental performance of polluters is changed to the establishment of goals, standards and norms while leaving the selection of measures and strategies to the polluters. In addition, dirigistic governance is transformed into the formulation of favorable conditions for environmental improvement activities by enterprises (cf. Hogenboom et al., 2000). Through such transformations in environmental governance (often referred to as reflexive governance or community governance), larger responsibility and tasks are given to the polluters. Negotiated environmental agreements are probably one of the most significant recent instruments in this shift (cf. Carter, 2001).

Negotiated environmental agreements or 'industrial covenants' are different from so-called voluntary approaches. These agreements have emerged as a prominent environmental policy instrument during the early 1990s in most OECD countries[41]. Negotiated environmental agreements are agreements reached following a process of negotiation between two or more parties, of which at least one party comes from the public authorities and one from the business/industry community. Such a negotiation results in a commitment of all parties to achieve certain agreed objectives on environmental improvements, formally recognized by government authorities and subject to sanctions and/or positive incentives (cf. Lindhqvist, 2001).

Negotiated environmental agreements are sometimes a useful instrument in a transitory stage towards stricter environmental standards, entailing goal fulfillment on a voluntary basis in stead of on the basic of legislative force. In doing so, businesses adopt certain standards or targets which are adapted to their specific circumstances. With consent of the parties concerned, these covenants might also be able to reach higher levels of environmental protection than legal standards require.[42] The government can encourage and facilitate the development of negotiated environmental agreements by raising public environmental awareness, establishing an effective distribution system of environmental information, enhancing the capacity of sectoral associations and securing the citizen right to access information sources about the locally environmental situation.

Van Tatenhove and Leroy (2003) recognize that recently a new type of 'covenant' is emerging in environmental politics. This new type is a result of that is the cooperation

[41] In practice, since 1980s, some Western governments such as Netherlands, Sweden, UK, have made so-called 'gentlemen's agreements' with several branch associations such as the chemical, agriculture and transport sectors in order to reach certain targets of environmental policy. The increasing number of agreement was recorded in Japan, Canada, New Zealand and the USA.

[42] One such good example in the Netherlands as well as in other European countries is the establishing of so-called 'target group approach' where responsibilities for particular environmental pressures are partly shifted to groups of 'polluters'. These target groups are invited and encouraged to share the responsibilities and political power with the Government by setting their suitable environmental policies.

between civil society representatives and market agencies. Such a cooperation shares with conventional negotiated environmental agreements their non-legally binding character, but differ in the role of the state in negotiating and 'enforcing' such agreements. A good example of these new types of 'covenants' is nature conservation in Central America by McDonald, Conservation International and local NGOs. This 'private' agreement forms a renewal of conventional politics, as private actors define the rules of policy and politics. In the literature this is often also referred to as sub-politics: environmental politics outside the formal political domain.

In brief, such innovative approaches seem to be a promising strategy for shifting part of the environmental responsibilities and pollution control to actors and institutions outside the state. This can be useful supplementary strategies and instruments to contribute to the goals of state environmental policy. But up till now, most of these negotiated environmental agreements and sub-political arrangements are strongly related to developed countries. The question is to what extent and under what conditions these innovations also are relevant, useful and effective for developing countries. Lindhqvist (2001: 44) states rightfully that "more experience is needed before solid conclusions can be drawn concerning the potential for voluntary approaches in various fields of environmental policy, as well as in various geographical, political and economic settings".

3.5 EPILOGUE

As suggested before, in this research, the third core feature of ecological modernization theory, also known as political modernization with its four characteristics, is used to analyze and understand the relationship between state and small and medium-scale enterprises in contemporary environmental policy in Ho Chi Minh City (HCMC). This will be done in the context of three underlying environmental programmes: relocating polluting industries to industrial zones, end-of-pipe treatment schemes and cleaner production. In doing so, this research highlights to what extent the role of the state changes: from a mere command-and-control regulation towards more negotiating, enabling and facilitating strategies, and to what extent tasks and responsibilities of the state for environmental restructuring and reform shift to the market.

4. ENVIRONMENTAL POLICY EVALUATION METHODOLOGY

Environmental policy measures differ significantly among each other, and no single evaluation methodology is appropriate to all of them. Studying the MEANS[43] collection, aimed at improving Methods of Evaluating Structural Policies, taught two lessons. Firstly, evaluation methodologies are still under development, and therefore it is unwise to be too dogmatic in seeking to identify the 'best' evaluation approach. The second lesson shows there is no single approach that would be equally applicable to all types of environmental measures in all circumstances.

Nevertheless, seeking and developing a suitable approach to evaluate industrial pollution control measures in HCMC is the main purpose of this chapter. The chapter starts with a review of the evaluation literature regarding environmental policy, by paying special attention to general concepts, key criteria, ideas of effects and effectiveness, culminating in the development of an evaluation framework and the construction of the main steps to evaluate an environmental policy. Subsequently, the policy network theory is introduced as an analytical tool to investigate the relations and interactions between the main actors in policy making and implementation in order to explain the outcomes of policy measure and the successes and/or failures of policies. Finally, this chapter focuses on the applied research methodology and methods of this study, which includes the general methodological approach, the research strategy, the selection of three case studies and their sub-case studies, and the methods of data collection.

4.1 EVALUATION OF ENVIRONMENTAL POLICY

4.1.1 Policy evaluation – concepts

There are many definitions of the term "evaluation", each having its own merits and shortcoming. Nagarajan and Vanheukelen (1997) illustrate the wide variety of definitions that circle in the literature. They give a selection of possible definitions:

"A critical and detached look at objectives and how they are being met" (cf. HM Treasury, 1998).

"The examination of whether the legal, administrative and financial means put into place by a programme have enabled it to produce and to attain the objectives which were assigned to it" (cf. Conseil scientifique de l'évaluation, 1996).

"A process which seeks to determine as systematically and objectively as possible the relevance, efficiency and effect of an activity in terms of its objectives" [44]
"The systematic application of social research procedure for assessing the conceptualisation, design, implementation and utility of public programmes" (cf. Rossi and Freeman, 1993)

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[43] MEANS is a programme of the European Commission. It is aimed at improving Methods of Evaluating Structural Policies. The realisation of the Programme was entrusted to Eureval-C3E from 1994 to 1998. Results of this Programme are gathered in a set of 6 volumes: the Means Collection (source: Eureval C3E, http://www.eureval.fr/english/publications/means_programme.htm)

[44] United Nations (?)

"An independent, objective examination of the background, objectives, results, activities and means deployed, with a view to drawing lessons that may be more widely applicable" (cf. MEANS Glossary).

"The judgement of public interventions according to their results, impacts and the needs they aim to satisfy" (cf. European Commission, Directorate-General for Development, 1993).

"The process of forming a judgement on the value of a programme" (cf. Viveret, 1989).

Given the variety in definitions, the introduction of one overall definition of 'evaluation' seems impossible. One can also seriously question the usefulness of trying to encapsulate this variety into one definition. As an alternative to formulating one definition, Nagarajan and Vanheukelen (1997) suggest that evaluations should be characterized by a number of characteristic elements: evaluations have analytical qualities, are systematic, are issue-oriented and user-driven elements, and produce reliable information.

In this study the emphasis is on policy evaluations. But even within that restricted area we can have a variety of interventions that can be evaluated. If we restrict our attention to the public sector, three kinds of interventions are distinguished. Evaluations can be applied at all three levels (cf. Nagarajan and Vanheukelen, 1997):

- Project - a single, non-divisible intervention with a fixed time schedule and dedicated budget.
- Programme – a set of organised but often varied activities (a programme may encompass several different projects, measures and processes) directed towards the achievement of specific objectives. Programmes also tend to have a definite time schedule and budget.
- Policy – a set of activities, which may differ in type and may have different direct beneficiaries, which are directed towards common general objectives and goals. Unlike projects and programmes, a policy is usually not delimited in terms of time schedule nor budget.

In this thesis, as presented in chapter 1, the overall objective of the research is to contribute to the improvement of environmental policy and strategy that aims at a sustainable development of SMEs in HCMC-Viet Nam. Thus, the emphasis of policy evaluations here will be at existing pollution control programmes and policies. More specifically, and as will be detailed later on in this chapter, three interventions will be evaluated: the cleaner production programme, the polluting industry relocation programme and the end-of-pipe treatment policy measures. Arguable – in terms of the distinction of Nagarajan and Vanheukelen (1997) - the later one can be called a policy, while the first two are rather programmes.

Policy evaluation studies in the field of environment usually seek information on current and expected effects of existing environmental policies. They typically try to answer questions such as: which direction are current pollution control measures following; what are the actual effects of these measures/programmes/policies; to what extent do the measures/programmes/policies contribute to achieving the original objectives; at what cost have these objectives been (partly) achieved? In other words:

in policy evaluation studies a number of evaluation criteria have been developed and are used, which are addressed during the evaluation processes and which enable a final judgment on the polices following the questions mentioned above (cf. EEA, 2001). Some of the most used criteria are introduced here, without however being exhaustive. The criterion *relevance* focuses on a justification of the policy in relation to the expected objectives and actual needs of society. The criterion *effect* aims at the results of a policy that can be directly attributed to the implementation of the very policy. This requires the existence of a causal link between the policy that is implemented and the effect in terms of its intended impacts on human behavior and the environment. The criterion *effectiveness* entails a judgment about to what extent the expected objectives and targets of the policy measure have been achieved. This requires comparing the effects of the policy with its intended objectives. And finally the criterion of *cost-effectiveness or efficiency* refers to a comparison of the effectiveness of a set of measures or a policy with the cost of implementing them. A more cost-effective measure will have achieved greater results for less money.

Figure 4.1 shows an evaluation framework in which these criteria are put together and made visible. This framework is developed by the European Environmental Agency (2001), one of the environmental institutes that has perhaps most contributed to developing, systematizing and standardizing environmental policy evaluation research. Through its numerous evaluation studies the European Environmental Agency has shown that these evaluation criteria are indeed most relevant in assessing successes and failures of environmental policies, both across media and across countries.

Due to unended characteristic of the pollution control measures in HCMC, this study will mainly focus on *intermediate* evaluations and partly on *ex-post* evaluations. *Intermediate* evaluations are conducted during the implementation of a policy. *Ex post* evaluations, which are conducted either on or after the completion of a intervention, rely on the collection of information about what has actually happened following the introduction of a particular measure/policy – thereby establishing the actual effects of the measure and allowing a comparison of the relative effectiveness of different measures in meeting their objectives, as well as their relative cost-effectiveness (EEA, 2001). Nor can *ex-ante* evaluations be applied for future control policy, because any proposal for industrial pollution control policy in the near future is lacking. Any pollution control policy that has been designed in HCMC should have gone through an ex-ante policy evaluation to assess beforehand its effectiveness and cost-effectiveness, but in the case studies used in this research we have not been able to retrace any systematic ex-ante evaluation.

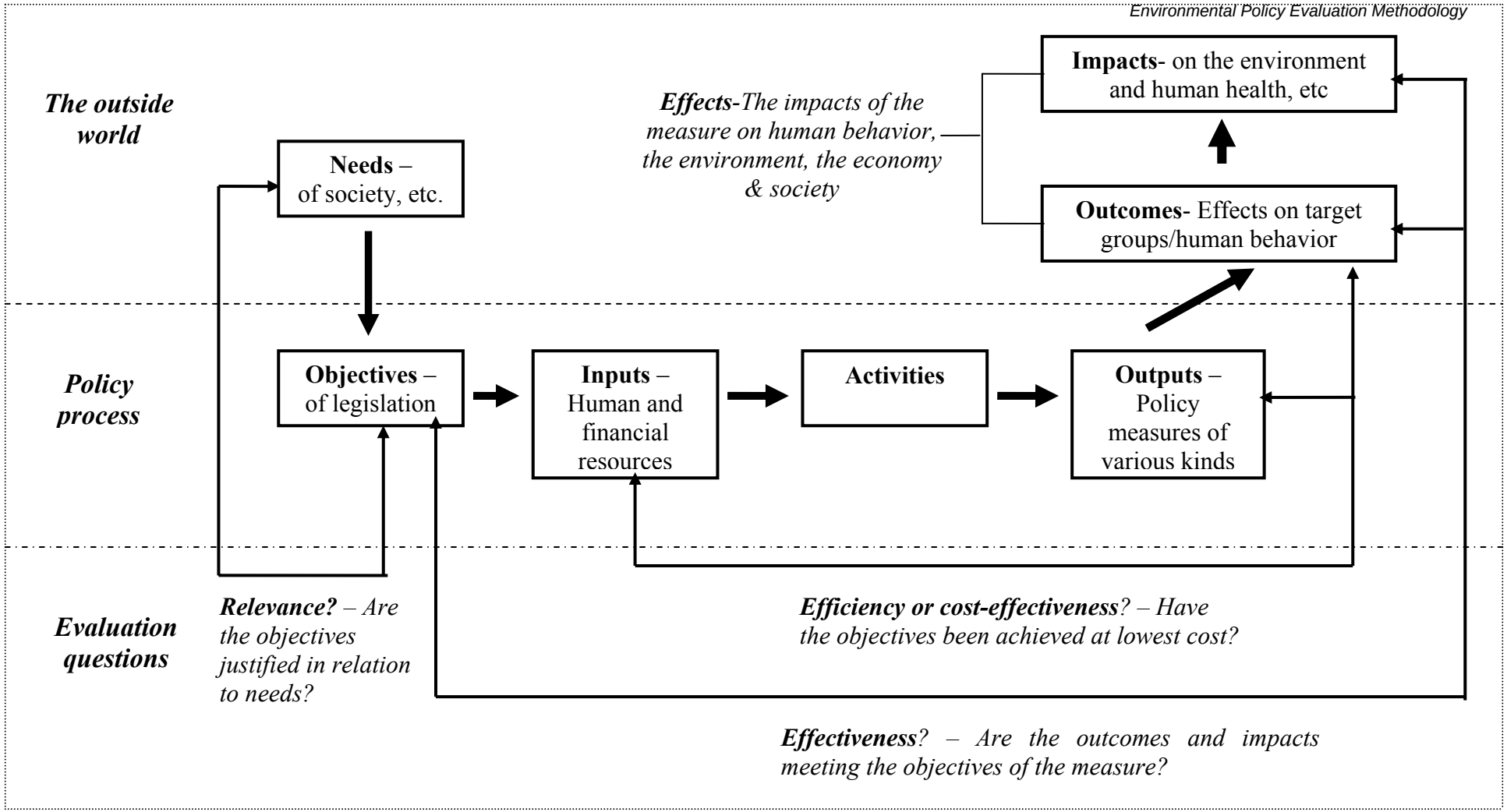

Figure 4.1 **Evaluation framework for environmental policy** *(modified from EEA, 2000; Nagarajan and Vanheukelen, 1997)*

4.1.2 Main steps to evaluate an environmental policy

In line with the concepts and evaluation criteria developed in previous part, three major steps to carry out an evaluation of environmental projects/programmes/policies can be identified (see Figure 4.2). The first step relates to understanding the policy formation process and its objectives. The second step concentrates on identifying the effects of the policy and determining the effectiveness as well as the efficiency (cost-effectiveness) of the policy measures. Finally, the last step identifies the failures and/or successes of the policy and proposes new initiatives for improving the policy with respect to (one or more of) the evaluation criteria.

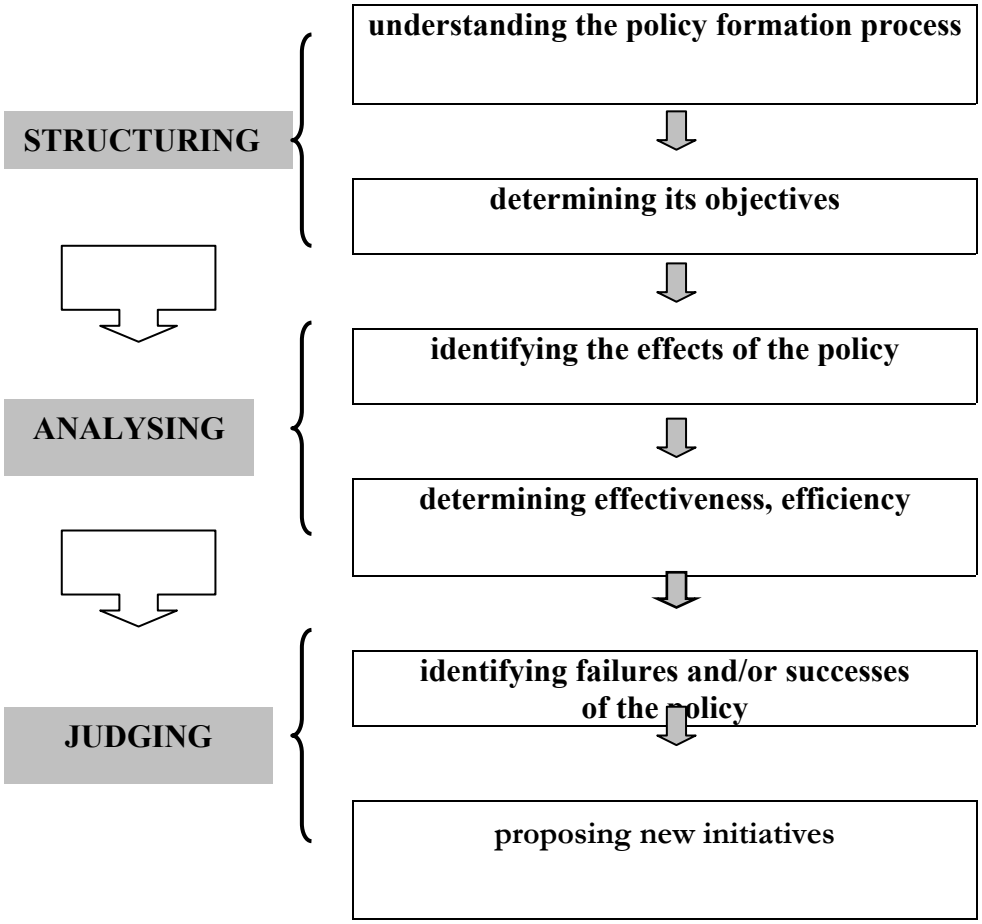

Figure 4.2 Main steps to evaluate an environmental policy

Step 1 - Understanding the policy formation process and determining its objectives

In this first step, we need to understand the background and the process in which a policy is developed and implemented, and to determine what is supposed to be achieved by the policy: what are its objectives and goals? While this might seem a relatively straight forward exercise, there will be several challenges when being applied on concrete policies:

- *There are (too) many goals formulated in the policy*. Then, which goals should we focus on in our evaluation? It is clear that the goals must closely relate to the adopted intervention, but even considering that it remains (most of the time) difficult to determine the main goal or objective.

- *Goals are often formulated in a very general and vague way*. Such goals are difficult to evaluate in term of goal achievement or effectiveness. In general, with such goals, the result of evaluation will be at best formulated in qualitative statements on effectiveness and cost-effectiveness (rather than in more precise quantitative ones).

- *The time period for goal(s) achievements varies or is very long*. Mickwitz (2002) argues convincingly that due to the nature of many environmental processes the time elapsing between action (in terms of policy interventions) and final outcomes of environmental policy (in term of impacts on the environment) is often very long, frequently decades and sometimes even centuries. Not all effects (in terms of impacts) can therefore be evaluated in time, especially when there is a need to know if we are on track. In order to remain able to judge the effectiveness of the policy, evaluations often focus on outcomes or outputs, rather than on impacts. Especially output variables are less time dependent. In addition, causal links are easier to establish between policy interventions and outputs, than between policy interventions and outcomes or impacts.

- *Objectives of policies can change over time*. The process of changing policy measures or even policy objectives is quite common in practice, certainly over longer time periods. Sometimes this is related to progressive insights in successes and failures of policies of new knowledge on environmental problems, but often strategic objectives of authorities are involved. As Browne and Wildavsky (1983)[45] argue: "It is intelligent to alter objectives to fit resources, to adjust programs to face facts, as well as to fit resources to objectives". Given a moving target, which objectives should be evaluated in an evaluation process? Depending on the purpose of evaluation, the available resources and the times stretches, we could choose the original objectives, the revised ones, both or objectives formulated independent from the policy process.

Step 2 – identifying the effects of the policy and relating effects and outcomes due to the policy to the objectives and inputs, in order to determine effectiveness and cost-effectiveness.

In this second step we first need to identify what has happened following the policy implementation not only in the separate target area (i.e. the effects on human behavior, on environmental quality, on the society and the economy), but also in related areas due to unintended consequences of policies. Subsequently, we need to determine to what degree these changes and effects are indeed caused by the policy measure(s) or a consequence of other developments. Especially identifying this causal link proves far from easy in environmental policy evaluations, as many interfering factors are potentially (co-)determining the effects. Second, we need to determine to what extent the policy goals as formulated are achieved over the time frame of the

[45] Source: Mickwitz (2002, p.5)

policy. In other words: do the effects of the policies meet the original objectives? Finally, there is often an interest in the costs aspects of the policy. Have the objectives been reached in the most cost-effective way? This question asks for a comparison between the inputs into policy processes (in terms of resources) and the effects as far as these relate to the objectives.

In performing this step, the following suggestions of Mickwitz (2002: 10-11) should be taken into account and might prevent us from too hasty conclusions. In those cases or policy evaluations where goals are not achieved, one should not automatically conclude that the policy has been unsuccessful. Autonomous developments, interfering factors, partly achievements, positive side effects and other reasons may all balance a negative conclusion on the policy interventions. Thus, goals that are not reached by policies may not always be a problem. In such situations it is important to fully reveal the situation and the reasons for non-achievement and learn from that. Therefore, it is essential to analyze and understand in great detail at which points and why policies are not effective and/or do not reach the objectives they were designed for. By the same token: goal achievement does not tell us the whole story on policy effectiveness. Goal achievement may be related to other factors than the policy itself, it may come along with unintended negative effects on other areas (within the environmental field or beyond) or it may come with extreme high costs in terms of finances and human resources.

Step 3 – identifying the failures and/or successes of policy and proposing new policy measure

There are two main tasks in this final step. The first task is discovering the main causes for failures and/or successes of a policy measure. The causes could be related to internal (distribution and exchange of resources, core actors, interactions between actors, etc.) and/or external factors (such as (inter)national economic, social, political developments), which themselves can be expected or unforeseen (cf. Mol, 2003). In this task, several questions need to be investigated and understood. What is the power of different actors, in terms of resources, in the policy intervention process? Which barriers keep the policy intervention from achieving its objectives or hinder the causal mechanisms to function properly? Which conditions are unfavorable in the intervention, and are potentially influencing the outcomes and impacts negatively? A policy network analysis (as will be presented below) is a useful analytical tool to understand the causes behind successes and/or failures in this step, as it tries to understand the functioning of a policy intervention in a social system.

The second task is to design, based on the analysis of the causes for failure and success, new policy interventions that are better equipped to reach the objectives. A SWOT analysis can be an effective way of analyzing new policy proposals through identifying their Strengths and Weaknesses, and to examine the Opportunities and Threats, which they may confront (cf. EEA, 2001; Mol, 2003). As such lessons can be drawn to improve existing policies and/or to propose completely new policy initiatives. If we do the latter, we turn in fact to ex-ante policy evaluations.

In summary, environmental policies for SMEs in HCMC are an on-going process as none of these policies have yet been finalized. Thus policy evaluations in my field should be conducted primarily as an intermediate evaluation and less as an ex-post or

an ex-ante evaluation. The most useful evaluation criteria for pollution control policies of SMEs in HCMC are effect, effectiveness and efficiency[46]. Based on these criteria, the environmental policy evaluation research carried out in this research is done through three main steps: Understanding the policy formation process and identifying its objectives, analyzing the effects of the policy and determining effectiveness, and identifying the failures and/or successes of policy and proposing new initiatives.

4.2 POLICY NETWORK ANALYSIS AS AN ANALYTICAL TOOL

One important feature of policy formulation and implementation is that it involves relations between different actors. The relations between state authorities (as the actors with a key responsibility and task in policy formulation and implementation) and the polluters (as the actors that are often the target of policy interventions) are of crucial importance. But of course other relations play an equal role, as we have theorized in the former chapter on ecological modernization: civil society actors, other economic agents, scientific institutions are among them. The links and relations between actors basically affect the output, outcome and impact of policy interventions and understanding these relations in policy processes become particular interesting in policy evaluations. The relations and interactions between government and industries in policy formulation and the implementation process (as the key relations) can be analysed by the policy network theory.

Policy networks concern the relationships in policy processes between authorities and other agents such as industrial actors. It is important to identify the main actors and institutions that determine a policy and its implementation process, their positions and the institutionalised interaction patterns. Policy networks in this research mainly entail government - industry relations. The government-industry relations in policy networks can be diverse and depend among others, on the economic and political importance of the industry, the national policy culture, the industrial policy of a country, and the degree of mutual understanding between industry and government.

According to Liefferink et al. (2000), in general, three dimensions are essential in studying and understanding policy networks. Firstly, the core of network study includes the analysis of the distribution, mobilisation, and exchange of resources within the network. Those resources may involve legal resources (authority), economic resources (financial abilities), political legitimacy, information, knowledge, and organisation (cf. Rhodes (1986) in: Liefferink D. et al., 2000). The second dimension in policy networks refers to the policy focus and the membership of the network. Policy focus does not only involve a factual delimitation of policy issue but also the way it is perceived by the actors in the network. Those actors actually taking part in the exchange of resources can be considered members of the policy network, usually to be divided into core members and more peripheral network members. The third dimension relates to factors that determine the interactions in the network. These factors are often referred to as the appreciative systems, the rules of the game and the strategic orientation. The rules of the game refer to both formal rules (relating to legal

[46] In my evaluation, less attention is paid to the *relevance* criterion compared to the three mentioned criteria because the expected objectives of three main pollution control policy cases in HCMC are clearly rationalized in relation to actual needs of enterprises and society.

resources and formal procedures) and informal rules, guiding the interaction in the network. The strategic orientation may range from insulation to incorporation.

In this evaluation study the policy network approach shall be used to understand how different actors influence the process of pollution control policy formulation and implementation, to analyse and explain the outputs/outcomes/impacts of a policy, and thus to understand the successes and/or failures of that policy (see Figure 4.5). The knowledge and insights gained from such policy network analyses are of course essential in any strategy to improve the industrial environmental policies in term of effectiveness.

4.3 REASEARCH METHODOLOGY

4.3.1 General methodological approach

In the objectives in chapter 1, this research has been identified as a *practice-oriented research*. Following the general research questions and objectives as well as due to restrictions in time and resources, case study research is applied as the central research strategy. The type of questions that need answers, as well as the limitations in time, finances, but also information, make a case study approach much more adequate than for instance a large scale survey. A so-called '*hierarchic comparative case study'* approach is applied, where sub-case studies that are embedded in three main pollution control policy cases for SMEs in HCMC. The three main case studies are carried out independently from each other and compared afterwards (through comparative analysis).

The methodology of research could be summarised as described in Figure 4.3:

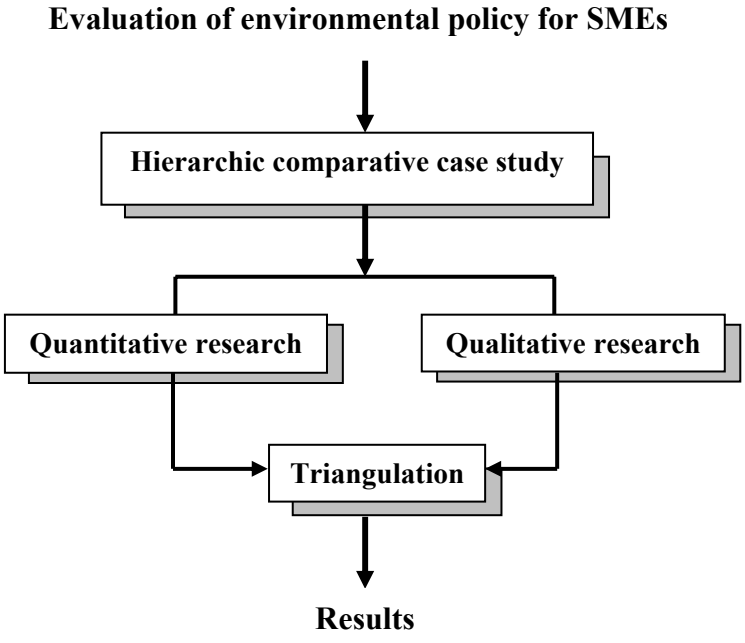

Figure 4.3 Graphical presentation of research methodology

The general research methods blend both *quantitative* and *qualitative* methods, as well as both *field* research and *desk* research. The *triangulation method* (figure 4.4), including semi structured in-depth interviews, (participatory) observation and the interpretation of textual and audio-visual material, forms an effective approach to gain an overall understanding of the research object. Especially the position of the principal investigator close to policy making and implementation processes, make participatory observations a key source of information. At the same time, this position might lead to a bias in observations and interpretation, and these methods are in constant need of alternative evidence and sources. Especially in information-poor environments, such as those in developing countries like Viet Nam, checking information against various sources might not always be possible.

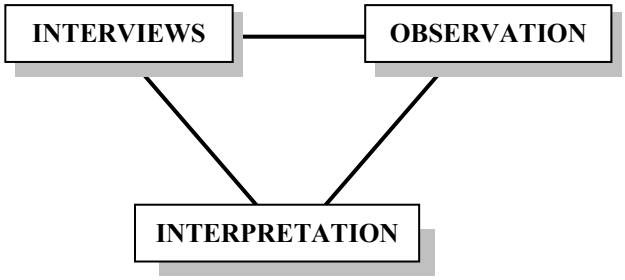

Figure 4.4 Triangulation method

4.3.2 Research strategy

The strategy of this research contains three steps. The first step is the development of an analytical framework which includes a theoretical framework (the ecological and political modernization theory, as outlined in chapter 2), a conceptual framework for analyzing and evaluating pollution control policies (as developed in this chapter), and the development of a research methodology with case studies and evaluation criteria (also this chapter).

The second step of the research strategy aims at understanding, analyzing and evaluating existing pollution control policies on small and medium sized industries in HCMC (polluting industry relocation programme, centralized and decentralized end-of-pipe treatment, and cleaner production programmes; described in detail in section 4.3.3 and further elaborated in three subsequent chapters). In this second step, the Policy Network analysis and Policy Evaluation method are used as analytical tools to understand, evaluate and explain the outcomes of the policies and their successes and/or failures.

The third step focuses on the comparative analysis of the three cases and the formulation of conclusions and recommendations, based on the empirical analysis and political modernization theory. The research strategy is summarized in Figure 4.5.

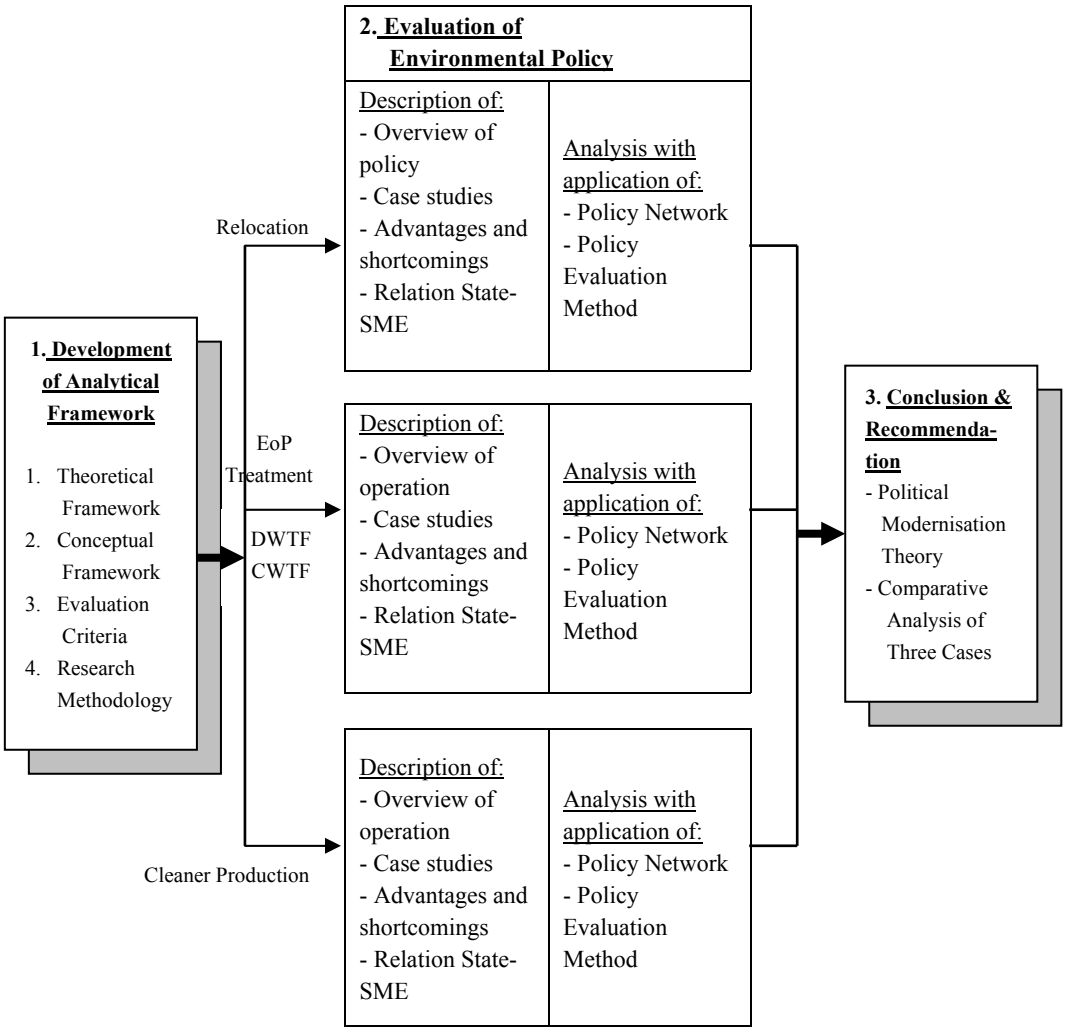

Figure 4.5 Schematic presentation of the research strategy

4.3.3 Selection of case studies

Accompanied with the growth of industrialisation and urbanisation, HCMC is facing increasing pollution problems, which are mainly caused by industrial activities. To control industrial pollution, the City authorities have implemented many policies and measures, ranging from conventional approaches such as end-of-pipe treatment, fines, industry closure, relocations to more communicative measures (such as "Black Book"[47], "Green Book"[48], environmental training, etc.) and a number of recently emerging (economic) policies and measures, such as the Cleaner Production (CP) programme, projects on energy saving and efficient use, the establishment of a revolving fund for pollution mitigation, and discharge fees. As a result, the industrial pollution has somewhat decreased during the last years, although the high industrial development in the city challenges these achievements.

[47] The Black Book is issued by the HCMC government and lists 87 of the most polluting industries.

[48] The Green Book is issued by the HCMC government and lists 50 enterprises that stand out for their high environmental performance.

As presented in chapter 1, SMEs contribute considerably to both local economic development and environmental pollution, and thus, this sector has always been and still is of major concern to the City government. Nevertheless, so far in HCMC, environmental policy measures have not been dedicated to SMEs, most of the industrial pollution control programmes are designed for and cover especially large-scale enterprises. Under such circumstances, the evaluation of the effectiveness of pollution control policies on SMEs is complicated, especially in situations with a shortage of information, a lack of monitoring capacity and a limited willingness to share data between public and business organizations.

In order to assess the effect of pollution control policies on the pollution by SMEs in HCMC the selected case studies focus on prominent pollution control programmes, including relocation to industrial zones, end-of-pipe treatment policies and cleaner production programmes. The two former policies are conventional approaches, which are more familiar to SMEs, while CP forms an alternative case. By analysing and understanding the motivations, mobilisations and exchange of resources behind each policy and comparing them with the experiences drawn from literature, it should be possible to assess the strengths, weaknesses and successes of these three policy programmes and, based on that and their comparison, recommend improvements in the environmental strategy towards SMEs in HCMC.

Case study 1- Relocation to Industrial Zones

Facing industrial pollution pressure as well as requirements of urban upgrading, the People's Committee of HCMC expressed strong interest in launching a relocation programme, where polluting industries would be transferred into industrial areas and its vicinities, often outside the city centre. The evaluation of the HCMC relocation programme is the first case study. The case study is conducted through the investigation of 5 rubber enterprises located in District 11 and 16 dyeing enterprises located in Tan Binh District, HCMC (see list of enterprises in Appendix 4). These urban districts can be seen as typical places with pollution problems caused by household scale industries as well as medium and large-scaled factories. The two districts have the characteristics of a sub-urban place, with a large number of industrial enterprises located within the residential areas.

There are specific reasons for selecting these rubber industries and dyeing industries. Firstly, these two sectors, as well as the selected enterprises in these sectors, are characteristic and representative for polluting SMEs in HCMC. They belong to the type of industries causing heavy environmental problems, and they have to relocate according to the government list of 14 types of industries to be banned from residential areas in HCMC. All selected enterprises have been forced to relocate in 2003 or 2004, according to governmental stipulations. Some of them have relocated successfully, while others still need to be relocated. Comparing and contrasting the two specific sectors could also be very helpful in clarifying the similarities and differences in applying the relocation programme by different sectors. A final reason for including these 21 enterprises is that they all have been willing to be interviewed and investigated, making information extraction and assessment possible. In each of the two sectors, one enterprise is selected for a further in-depth analysis for better understanding of the production situations, the level of pollution it causes and how the enterprise reacts to pressures from authorities and inhabitants regarding its pollution.

Case study 2 - End-of-Pipe treatment approach

So far, end-of-pipe (EoP) treatment is one of the most popular command-and-control approaches for pollution control in HCMC. Conventional policy instruments such as laws, regulations and licences aim to introduce end-of-pipe treatments systems in all industrial enterprises that pollute the environment in HCMC. However, due to lax environmental regulation, weak enforcement of authorities, as well as lack of environmental awareness from enterprise owners and managers, not all businesses which discharge wastewater or emissions have established a waste treatment facility. According to City environmental authorities, about 40 - 65% of the total industrial wastewater is treated. The ratio between the number of the enterprises that installed their own wastewater treatment systems and the enterprises discharging industrial wastewater is 38 - 45 %.

Based on experiences with end-of-pipe treatment approaches in HCMC, this case study is divided into two parts: (1) centralized waste water treatment approach for a number of polluters in an area; (2) decentralized waste treatment approach for individual polluters. The first part of the study includes an investigation of Le Minh Xuan industrial park in Binh Chanh district, in which a centralized wastewater treatment plant was built, and of two SME clusters (dyeing enterprises in district 11 and tapioca processing companies in Thu Duc district). In both situations (the industrial park and the two clusters) opportunities and requirements exist to establish centralized wastewater treatment systems, but the materializations are different. Four enterprises in the dyeing cluster and three enterprises in the tapioca cluster are selected to observe the manufacturing technology in detail, the wastewater handling and the reactions towards the requirement of centralized wastewater treatment. This part aims to evaluate the successes and failures of centralized wastewater treatment approaches to SMEs that are situated in densely populated areas.

The second part of the study is conducted through a survey investigation of 48 SMEs in sectors such as chemistry, dyeing, mechanics, glass, plastics, rubber, food production, beverage, and paper (see list of enterprises in Appendix 5). Three districts have been selected for this: district 11, Tan Binh district and Thu Duc district. These 48 companies are all (potential) polluters and many of them have already invested in their own decentralized treatment facilities. Via a survey we aim to get a better idea of the reasons behind installing or not installing decentralized waste water treatment systems following governmental policies. In a sub-case study, on a paper enterprise, details on manufacturing technology, waste treatment activities as well as costs are investigated to improve understanding of the financial reasons behind successes and failures of end-of-pipe policies.

In both parts, enterprises are again selected on the willingness to be interviewed and investigated. Experiences from this study force to recognise that access to information and permission to interview employees of SMEs is one of the main problems environmental researchers in Viet Nam have to face.

Case study 3- Cleaner Production Approach

Cleaner Production (CP) policies are often put forward as a win-win alternative towards relocation, closure and end-of-pipe environmental policies, as both economic and environmental gains go hand-in-hand. But most of the success stories of CP relate to large-scale enterprises, while SMEs have hardly been addressed by CP policies up till now. Some CP demonstration projects, which are supported by international organization such as UNIDO, SIDA, USAEP, ADEM, UNDP, have been promoted and developed in HCMC since 1997. Through some initial successes, a CP approach is emerging step by step as a promising measure for controlling industrial pollution in HCMC. While initially only a national CP policy existed in Viet Nam, a decentralization is taking place at the moment in which the larger municipalities or provinces develop their own cleaner production policies and measures.

The case study aims to understand and evaluate the opportunities and difficulties in promoting and implementing CP in HCMC, through a survey of 19 enterprises which have participated in CP demonstration projects or which have received a loan from the Industrial Pollution Reduction Fund to perform in the CP programme. These enterprises include large-scale (eleven) as well as small and medium-scale (eight) enterprises, situated in different areas in HCMC (districts 7, 8, 9, 11, 12, Tan Binh, Binh Thanh, Hoc Mon and Thu Duc) (see list of enterprises in Appendix 6). There are several reasons to include large-scale enterprises in this survey. First, the CP approach has only been recently introduced in Viet Nam, therefore the experience with CP promotion under the City's condition is limited. And the experience started with large-scale enterprises, so any evaluation based on past performances will have to include large-scale enterprises. Second, including these enterprises enables comparing differences in CP performance between large-scale factories and SMEs.

4.3.4 Methods of data collection and analysis

Primary data collection

Data related to manufacturing technology, policy implementation, practical pollution treatment technology, environmental management measures, environmental pollution situation, etc. are collected through on-site investigations and surveys at selected enterprises in Le Minh Xuan industrial park, Districts 7, 8, 9, 11, 12, Tan Binh, Binh Thanh, Hoc Mon and Thu Duc and surrounding areas. Also in the case of surveys, information was always collected via face-to-face interviews and site visits, rather than via the mailing of questionnaires or telephone interviews. In addition, in the case of end-of-pipe treatment, sampling and measurements took place with respects to air emissions, wastewater pollution loads and levels of compliance with regards to environmental standards and legislations. This information is essential to evaluate the effects and effectiveness of policies at the level of enterprises, but enterprise level pollution and emission information are hardly available in HCMC. Questionnaires and various intensive face-to-face interviews are used to supplement information related to production activities as well as opinions and experiences (willingness, advantages, constraints, comments, policy effectiveness) of entrepreneurs, investigators and investors in pollution control measures.

To obtain information related to the role, contribution and practices of core policy actors in establishing and implementing policies, in-depth interviews were held with experts and consultants at institutes, universities, and research centers, such as Institute of Environment and Resource (IER), Polytechnic University, Energy Study and Development Center (ENERTEAM), Environmental Technology Company (ECO), Environment and Technology Center (ETC), Environmental Protection Center (EPC), etc.; and with representatives of (environmental) authorities in district's environmental management sections, district PCs, DOSTE, DONRE, DOI, DPI, DOF, HIFU, HEPZA, Steering Committee members, industrial zone management boards (see the list of interviewees in Appendixes 4, 5 and 6).

Additional necessary data and crosschecks are also received through face-to-face, telephone, and Internet discussions with managers of factories, authorities and consultants.

Secondary data collection

Main secondary data sources are annual/periodical environmental reports of enterprises and industrial park's management boards; policy documents, implementation reports and inventory or supervising results of related authorities; environmental demonstration material and reports of projects by local, national and international agencies; research documents of institutes and universities; and from workshops and conferences where research, projects and policies were presented and discussed.

Other useful secondary information was received by reviewing local and international literature, journals, newspapers, and internet sources, especially for identifying best practices and foreign experiences in the three policy programmes. This formed an important source for the recommendations (in chapter 8).

5. ASSESSING INDUSTRY RELOCATION PROGRAMME

5.1 INTRODUCTION

On the one side, relocation polluting industries to industrial areas outside the city gains a number of advantages. In countries where the government has strong control over the economy, relocation is often part of a national development policy (e.g. in South Korea, Japan or China). At the same time, industrial relocation in some cities can be an aspect of local development and land-use planning policies. For instance some older cities may have historic areas within their central districts that retain the cultural heritage of the community and merit conservation (cf. Darliana, 2003). Large-scale industries which occupy a large area can also be the target of land use redevelopment. Industrial land may be considered undesirable, because of its low economic efficiency if there are opportunities to redevelop the land into more profitable commercial, residential or tourism purposes. For instance, in Dalian (detailed description in paragraph 5.2.2), some of the large, stated-own industries in residential areas raised very little revenue for the city and were subsequently relocated to suburban areas. In improving urban environmental quality, many rapidly developing cities often export polluting industries to suburbs or surrounding smaller cities. This strategy also includes the export of industrial wastes to central treatment facilities that are located outside of the city boundaries. A number of successes are recognized with significant positive effects (cf. Bai (2002), Darliana (2003), Morikiho (2003), Wu (2003), and Yu (2003)).

On the other side, if relocation programmes are not planned and prepared sufficiently, they could cause unexpected negative consequences, such as economic problems (e.g. interrupting production, losing enterpeneurs' reckoning, losing skilled workers, etc.) and social problems (e.g. loosing jobs, unpleasant living conditions for surrounding residents) (cf. Bai (2002), Kwon and Lee (2003), Yu (2003)). Besides, some researchers argue that if adequate environmental enforcement and management in the new industrial area is lacking, relocation to this area would result in increased pollution at a different place rather than in pollution reduction - so-called 'relocation of pollution' (Dasgupta, 2000; Frijns, 2000; Bai, 2002; Don, 2002; Kwon and Lee 2003).

At present, in HCMC a programme for the relocation of polluting industries into industrial zones and peripheral areas is emerging being part of the City authority's environmental policy. A series of measures and activities have been devised by the City's departments to prepare an integrated industrial relocation plan for the whole city. This plan includes industry identification, source inventory, polluting industries categorization, selection of priority industries for relocation (voluntary or forced), social and financial support mechanisms, incentive policies, and so forth. So far, the programme is still an ongoing process. Therefore, it is not possible to evaluate its final effects and effectiveness, nor can any final conclusions be drawn with respect to either the success or failure of the programme. However, an intermediate evaluation of the programme implementation can warn against, and prevent, potential negative results to the environment as well as to other social-economic aspects.

In this respect the objectives of this chapter are (1) to introduce international experiences from two Asian countries (China and South Korea), that are comparable to the Vietnamese situation in terms of economics, politics and culture, both countries have witnessed successes as well as failures of relocation; (2) to give an overview of the current state of implementation of the relocation programme in HCMC; in addition, two case studies of relocation will be reported: a dyeing SMEs and a rubber processing SMEs; (3) to explain and analyze the institutional structure of the relocation programme; (4) to assess the advantages and disadvantages for implementation of the programme; and (5) to come up with conclusions and recommendations for the programme's further development.

5.2 INDUSTRIAL RELOCATION EXPERIENCES IN ASIA

5.2.1 Industrial relocation as part of an integrated urban management strategy

Industrialisation often synchronises with urbanisation as it attracts large number of labourers, and triggers the development of water supply, transportation, housing and other service systems. Beside developing the economy and increasing social benefits, industrialization plays a major role in the amount of pollution.

In many Asian cities, assuring urban environmental quality often goes together with significant attention paid to controlling industrial pollution. Then, city authorities generally apply one or several of the following options. First, a strategy of "tolerance" can be implemented, which implies efforts to mitigate industrial pollution through administrative supervision, prompting and encouragement that do not jeopardise industrial competitiveness nor economic development. Second, a strategy of adopting stricter regulations can be developed, which forces polluting industries to reduce or eliminate on-site pollution (often called command-and-control approach). In a third strategy, polluting industries, or the waste streams of industrial processes, either are closed, relocated or exported to suburban districts, other cities, or the rural areas - called an "out of sight, out of mind" approach (Bai, 2002).[49]

In HCMC, the first two strategies have existed some time, while the third one has only recently been introduced. While HCMC tends to become a waste or pollution 'exporting' city, surrounding provinces turn into sinks for receiving waste from their big brother.[50] One can imagine that the surrounding areas are less enthusiastic towards such a relocation policy/strategy.

In general, large severely polluting industries that have become increasingly unviable and have a low economic efficiency are often prior objectives of a relocation programme. Relocation experiences aiming directly at SMEs are still rare. But experiences of relocating large industries can be helpful to draw lessons on

[49] A separate option rarely exists, at present the industrial pollution control is performed by combined option, which recently is integrated with economic and communication instruments.

[50] E.g. in a meeting (Thursday 28/8/2003) on hazardous waste management in Southern Key Economic Zone (SKEZ) including HCMC, Binh Duong, Dong Nai and Ba Ria - Vung Tau, all of the four provinces considered it very necessary to establish waste disposal facilities and incineration plants in the area, but were not eager to locate these into their own territory. The provincial authorities are responsible for issues within their boundaries, but often do not like to acknowledge that their problems often carry larger spatial consequences at longer temporal scales.

environmental governance and policy making on SME relocation. Given that, two Asian examples of relocation will be covered. One (Dailian, China) is known as a successful experience of relocation and the other (Korean cities) is known as a less effective relocation programme.

5.2.2 Dalian-China - "to be the best rather than the biggest"

Background

Dalian City is located in the south of Liaodong Peninsular, China, covering a land area of 12.5 thousand square kilometres with 5.43 million people. Dalian is an important industrial and trade city, as well as a port city, in China. It has also become increasingly famous as tourist attraction. Dalian is recognised as one of the few leading cities in Northeast China in terms of openness, vitality, overall economic strength as well as economic growth rate. The GDP per capita of Dalian reached yuan 20,000 (US$ 2,600) in 2000. Air and water pollution are Dalian's two major urban environmental problems, and industries have played a major role (80%) in both cases. Most heavily polluting industries (e.g. metallurgy, chemicals, petrochemicals and cement) were located in the central and most populous districts of the city. The relocation of the major polluting industries was one of the key features of the municipal government's sustainable development strategy.

In the 1980's the City authority conducted a survey on pollution discharges in the city and identified the major polluting sources. Subsequently it adopted stricter measures, including deadlines for the installation of end of pipe treatment facilities, the prevention of new sources of pollution through Environmental Impact Assessment (EIA) and other regulatory procedures. This operation was and is being supported by increased environmental investments from government funds.

The City simultaneously adopted an economic development strategy, which gives priority to less polluting and more value added light industry and service businesses in the central areas. In 1993, the City integrated industrial adjustment and spatial redistribution objectives into its overall development plan. After three years, 73 of the 115 listed polluting companies had moved and 18 were closed down. By 2001, 105 enterprises had been relocated and 28 closed down.[51]

The industries were located to an Economic and Technological Development Zone (ETDZ) – where a new industrial estate is developed according to an approved plan with integrated residential, commercial and public areas. The Dalian ETDZ has a surface area of 28 km^2 of which 15 km^2 is designated for industrial use. The zone attracted some 1,150 companies that choose to locate there.

[51] Source: Don Taylor, 2002.

A model for industrial zone management - Dalian Economic Trade and Development Zone (DETDZ)[52]

For planning a new zone, DETDZ applied the guideline 'Firstly prevent and secondly control' to design its infrastructure, including industrial area, utilities, commercial place, residential communities and public areas. Command and control measures such as EIA, the three synchronisation (which requires that pollution facilities and the principal parts of a construction project should be designed, constructed and put into operation in a synchronised manner), and economic measures such as systems of fees for air emission and waste water effluent have been conducted. The government paid specially attention on how to perform enforcement effectively and efficiently. Each factory must be inspected annually for pollutants, noise, dust and water. Green space is favoured by setting off 24% of the grounds.

Such stringent requirements have not disheartened industries. Rather, they appreciate the clarity of the regulations, the city's enforcement record, and more pleasant surroundings.

Besides, DETDZ considered an environmental management system (EMS) for the industrial zone of high value. By considering the local economic and social reality and analysing the existing environmental regulations and laws, an integrated approach supported by an environmental management system was stipulated. Through this system, DETDZ is able to set priorities for addressing the concerns of its community, as well as ensuring that its services are being delivered according to efficient and effective practices. According to Don Taylor (2002), the current EMS also supplies the City authorities a considerable degree of autonomy vis-à-vis higher government levels. This means that they are given substantial freedom to formulate their own policy priorities, select policy tools, design their own arrangements for enforcement and decide on the pace of implementation.

The environmental awareness in public has been actively raised through green education and publicity programmes organised by environmental agencies at different levels.

Overview of the Relocation Programme

The selection of heavily polluting industries that had to be removed was done under the regulation for 'Urban Enterprise Removal and Modification in Dalian'. The selection of enterprises was based upon economic and environmental criteria. Industries having low economic profit were closed down, while those which were profitable, but heavily polluting and/or located on land with greater economic potential, were listed for relocation. Relocating industries were strongly encouraged to improve production technology, update products to better meet international market demand, and establish facilities for treating pollution and reducing waste discharge. Industries with high levels of emissions were not allowed in or banned from the industrial zone and even anywhere in the city.

[52] Similar to HEPZA organisation in HCMC, the DETDZ Administration Commission (DETDZAC) is the official agency of Dalian Municipality in charge of the daily administration of functions inside the industrial zone while the Planning and Construction Bureau (PCB) of DETDZAC is in charge of environmental protection in the zone.

In order to speed up the process the City introduced a package of incentives. Relocating enterprises were able to benefit from: Receiving 40-70 per cent of the costs of removal and the comprehensive land price; support to the enterprise in site identification and land lease; a series of preferential exemptions for local revenues for a certain period under specified conditions; and participation in two extensive EU funded projects supporting Cleaner Production (since 1996) and the Lioaning Environmental Clean Up Programme (covering all major pollutants in the context of urban planning and development (since 1999)).

Taylor (2002) stated that an interesting feature of these incentives has been to allow the buyers of a relocating enterprise (a domestic or foreign investor) to use and own the original land. Social welfare factors were also taken into account to assist redundant workers to find alternative accommodation (or presumably to move with the relocating enterprise)[53].

Being located into the industrial zone, enterprises have also other privileges such as the ability of the municipal government to take just seven days to approve a factory license, which normally requires scrutiny and approvals from 17 different departments in the city and thus a lengthy time.

Small sized enterprises with common products were clustered together on a prepared site so that they could jointly being served according to their needs.[54]

Significant results[55]

The entire process has freed up to three million square metres of land in the central districts. Not only has industrial pollution been brought under control, but the city centre has also been improved commercially, environmentally and aesthetically. This has provided added value to the economic activities (such as a larger tax per square metre under commercial and residential operation), as well as considerably enhanced the market value of land and facilities.

An impressive feature of the policy has been the low cost housing projects set up to provide comfortable living space for workers and their families in and around the park. Coupled with low cost housing projects, per capita living space rose from 9.2 square metres in 1993 to 13.8 square metres in 1999.

The relocation provided more land for urban development as well as more parks and green areas. By this process, Dalian's Xinghai Bay has been changed from a degraded beach and waste disposal site into an attractive area of more than 700,000 square metres. The available green space in the centre increased by 40% and reached 8.5 square metres per capita.

Last but not least, the overall environmental benefits of the relocation programme are impressive. The Comprehensive Air Pollution Index (CAPI) declined by 45% from 7.88 in 1990 to 4.40 in 2000. By 1998, total industrial wastewater discharge had decreased by 4.1 million tons, COD discharge has decreased by 14,300 million tons,

[53] Clearly, this incentive is more flexible and open than the one related which the sale of land of SOEs in HCMC, as that must be decided by the Land Pricing Board.

[54] There exists a similar consideration in establishing handicraft villages in HCMC.

[55] Sources: Yu Di (2003), Taylor (2002) and Bai (2002)

and waste oil discharge by 2,700 tons. Although reduction in the wastewater discharged amounted to just 1% of the total, the reduction in COD accounts for the majority of total COD reduction during the same period. This indicates that a quite small number of relocated (and subsequently upgraded) industries caused most of the pollution. [56]

Unexpected negative consequences

According to Yu Di (2003), some unexpected negative consequences followed the relocation programme in Dalian. Firstly, the relocation of several polluting enterprises is unreasonable so it caused some pollution problems to surrounding residents in new sites. Secondly, some left land area in the city was used for new apartment buildings, but proved to contain soil pollution. Thirdly, some (new) products from the relocated enterprises in the estate met sale problems in the market. Fourthly, the adoption of advanced new technology in the relocated industries has caused workers to lose their jobs.

Final remarks

Even taking the unexpected negative consequences into account Dalian's industrial relocation programme is considered a success. The City not only removed pollution sources from the centre, and improved its urban environmental quality, but also implemented new urban development planning. The strong commitment and interest from leadership played an important role in the process[57]. The basic philosophy of the City leaders in the development of Dalian is "to be the best rather than the biggest". Therefore, the recent development policy of Dalian was based on the integration of upgrading urban functions, environmental improvement and market-oriented city management.

5.2.3 Industrial relocation in Korean cities

Background

In the early 1970s, the South Korean Central Government launched a policy of Heavy and Chemical Industrialisation (HCI). As a consequence, heavy and chemical industries have spread over Korean cities. Many of these polluting industries were widely scattered across major metropolitan areas, including Seoul, Pusan, and Taegu.

Facing industrial pollution, the city governments enforced to relocate, close-down or evict polluting industries. The main challenge of industrial relocation in Korean cities remains limited to the question how to promote the relocation of individual firms to designated industrial parks through effective financial modalities. In most cases, little attention is paid to the socio-economic and environmental consequences of industrial relocation in a longer perspective and a wider area.

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[56] Interestingly, a survey of wastewater treatment pollution of 20 companies in the Thuong Dinh industrial park in Hanoi showed that 4 companies were responsible for 90 per cent of the pollution load (Taylor, 2002). .

[57] Dalian government set up a leadership group of Dalian industry structure adjustment and relocation leaded by city mayor composed of relevant committee, agency, bureau and office (Yu Di, 2003).

The lessons drawn from the industrial relocation in Onsan Industrial Park and Ansan City reveal that such an approach must end with high socio-economic and environmental costs. Only if environmental effects in both importer and exporter areas are reduced, one can speak of a sound strategy.

The Case of Onsan Industrial Park

The City of Ulsan, a port city and industrial hub, is located at the southeastern end of the Korean Peninsula. This industrial city is one of the seven largest cities in Korea and has about one million inhabitants with one thousand and fifty-five square kilometers of total area. As of 2002, this industrial city has six national and regional industrial parks, and three additional local industrial parks are expected to be open by 2011.

As the HCI of the Korean economy was driven by the central government and Ulsan accounted for the predominant share in terms of industrial production, the city has unveiled a variety of industry-related environmental problems since the late 1970s. Up to now, the agglomeration of heavy industry and the population growth in Ulsan are still the major factors that cause environmental problems.

Given such spread endowment of industries in terms of location, Onsan industrial park was established in 1974 and 212 petrochemical, non-ferrous metal, and timber companies had been relocated to this park by 2002 (cf. Kwon and Lee, 2003). Onsan is regarded as a showcase with regard to the scale of urban industrial development and its impact on environment.

While little attention has been paid to environmental consequences of industrial concentration during the development of this industrial park, the "Outbreak of Pollution-related Disease" (ONSAN Disease) continued to draw large attention on the adverse environmental externalities since the mid-1970s. In fact, there are three major environmental problems: air pollution (SO_2), marine contamination (BOD and COD); and soil contamination (metals).

As a result, the Korean government was not only forced to pay enormous socio-economic cost due to environmental degradation, but also to implement several policy measures. The major steps taken by the Korean government include an "Emission Charge System" in 1983; the "Deposit Refund for Waste Disposal" in 1992; a "Waste Treatment Charge System" in 1993; and an "Environmental Improvement Charge System" in 1995. In addition, the government enforced the relocated firms in Onsan industrial park to install advanced pollution treatment facilities as well as to employ cleaner production technology in their production processes.

Although such a polluter-pay-principle approach and cost-recovery contributed to mitigate environmental problems, these measures were not enough to prevent further environmental degradation, both inside the industrial park and in the surrounding areas.

According to Kwon and Lee (2003), the pitfalls of industrial relocation policy in South Korea drawn from the case of Onsan are several: (1) too strong focus on just relocating enterprises; (2) strong priority to financial modality; (3) little attention paid

to environmental consequences of industrial relocation in a long-term perspective[58]; and (4) a lack of stakeholder participation.

The lessons drawn from the development of Onsan industrial park suggest that the following prerequisites should be reflected in the process of industrial relocation. First, institutional capacity at the governmental authorities should be built both at national and local levels, with respect to integrate environment objectives into economic development and to encourage public participation. Second, management capability must be enhanced in order to let planning take place in an integrated manner; to implement in a coherent manner; to enforce and monitor in a consistent manner; and to coordinate between authorities in a harmonic manner.

The case of Ansan City

In Seoul, from the early 1970s, land demand for trade and residential facilities has continuously increased, so that a number of small inefficient factories had to remove to the outskirts of the City.

The pollution law of 1971 granted the Mayor of Seoul Metropolitan City (SMC) the power to order polluting industries to move out of the city. Through the 1970s and 1980s planning and environmental laws and regulations encouraged (indeed enforced) the process of industrial relocation of those industries (often SMEs) that were considered unsuitable for Seoul. Many of them were relocated to Ansan.

This relocation policy was remarkably successful in terms of the number of relocated firms. The relocation started in 1978 and, within two years, 2,058 enterprises had been relocated, of which more than half moved to Ansan's Banwol industrial complex, 30 km south of Seoul. Of them 48 per cent were engaged in metallurgy, 20 per cent in chemicals and 14 per cent in dying and leather.

A series of taxation measures was adopted to promote relocation, which was mandatory for industries generating heavy pollution. The registration tax reform provided a 3 year tax exemption, extended to 5 years for industries relocating to designated local areas. Furthermore, newly established industries in large cities were subject to a Real Estate Speculation Penalty Tax, five times the norm. In addition, a great deal of 'political' pressure was brought to bear on the offending industries to relocate rapidly.

Special environmental stipulations for the relocation process did not exist and as a result pollution was simply removed from Seoul to Ansan. Lacking human resources at the local environmental protection bureaux caused lax enforcement. Old pipes for wastewater discharge often run underground in industrial parks, making it even harder to identify pollution sources or check illegal discharges by industries. Pollution treatment facilities often were not functioning properly, because of production increases, or were not fully operational because of management disregard. Among the 175 total recorded violations of air pollution discharge regulations in 2000, more than

[58] At the development stage, the government had not paid special attention to overall land use planning. Instead, they let relocated enterprises themselves negotiate with landlords and residents in the area. Due the fact that enterprises were only concerned with the purchase of cheap lots, the enterprises were spread over the entire area of the industrial park and many polluting plants were located just next to residential areas.

half were due to the improper operation of existing wastewater treatment facilities which caused bad smell. Conflicts between enterprises and monitoring authorities were also found. Waste abandoned by enterprises that have gone out of business presented another problem (cf. Bai, 2002).

According to Bai (2002), Ansan's environmental failure resulted from the following factors: Firstly, industrial relocation was only considered from the perspective of meeting the needs of Seoul, while the capacity of Ansan to address environmental challenges was not considered. Secondly, there were no regulations or efforts to improve the environmental performance of relocated industries. And thirdly, Ansan's urban development plan was inadequate. Most of the growth was due to increased employment opportunities brought by relocated enterprises, more than 100,000 in the Banwol Industrial complex alone. However, living conditions for those residents living nearby were unpleasant, to say the least, and the Ansan quality of life was poor.

The Korean experiences remind us of what can go wrong, even with the best aims and goals. Measured against its objectives the relocation programme from Seoul to Ansan was a great success and was highly beneficial in raising the quality of life, economic efficiency and land price values in Seoul. Unfortunately, the consequences for the importing region were disastrous (Taylor, 2002), so one could question the relevance of the objectives.

5.3 HO CHI MINH CITY's PROGRAMME ON RELOCATING POLLUTING INDUSTRIES TO INDUSTRIAL ZONES

5.3.1 Historical overview

Beside implementing mainly command and control instruments such as regulations on end-of-pipe treatment, fines and forced closure of polluting enterprises, the City authority has introduced other measures, such as economic, communication and support measures in industrial pollution control. As a result of 'the programme on pollution survey' for 265 industries in HCMC, 'Black Book 1 (1994) & Black Book 2 (1997)' drew up the lists of 87 highly polluting industrial enterprises. These enterprises were asked to perform measures such as end-of-pipe treatment and cleaner production[59] in order to meet the environmental standards. By publishing the Black Book, the Department of Science, Technology and Environment (DOSTE) aimed to utilise public disclosure as an enforcement incentive, which complements traditional enforcement mechanisms such as fines and penalties.[60]

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[59] Project " Reduction of Industrial pollution in HCMC" supported by UNIDO and funded by SIDA (Swedish International Development Co-operation Agency), was launched in 15 companies from the food processing, textile-dyeing processing and pulp & paper industries as demonstrations. Implementation of these CP measures contributed significantly to environmental improvement in areas such as wastewater discharges (20-66% reduction), air emissions (30-70% reduction), solid waste generation (up to 27% reduction). Government and UNIDO are approving phase 3 of this project. For wider dissemination of CP concept and benefits, DOSTE conducted series of training programmes targeting 9 environmental sensitive sectors and 1,000 small & medium enterprises in HCMC in two years (1999-2000). More information in chapter 7.

[60] However, the results of a survey conducted by the Ministry of Planning and Investment (cf. MPI, 2001) with the 87 firms listed in black books revealed that 90% of factories believe that appearing in the black books did not have an impact on the business of the factories; 84% of them said that being listed in the black books does not affect loan negotiations with financial institutions; and interestingly, 39% of factories think that it may have been an advantage to

As environmental pressure from industrial activity seems to be especially problematic in densely populated areas, the focus of local authorities has been on tackling pollution problems in these districts. Since the late 1990s there have been several independent district-level programmes for the relocation of polluting industries out of residential areas. In general, those programmes arose as unplanned and incidental activities, initiated by the authorities of various districts in HCMC to immediately ameliorate severe industrial pollution cases. In most cases the implementation of such *ad hoc* relocation-programmes moved slowly and their results in improving the quality of the living environment have been limited. Explanations for the relatively small impact of these relocation programs are the lack of clear and integral environmental objectives, the absence of incentives for industries to participate in the relocation programme and the fact that districts received no substantial commitment from the City authority.

However, by early 2002, the People's Committee of HCMC expressed a strong interest in launching a new, more integrated relocation programme for polluting industries, due to increasing environmental pressure and requirements for upgrading the urban living environment. In a resolution dated March 14, 2002 the City's Party stated that:

> *"The policy of the relocation programme for polluting enterprises not only deals with environmental problems, technology and equipment renovation, but is also associated with population redistribution, conversion of structural production and workforce. This policy further tackles employment, raises income and improves the living standard of suburban dwellers as well as urban reorganisation. The standing committee of the Party asserts that relocation of polluting enterprises is a right and logical policy, which has significant and important influence on both economic and social aspects. It is generally recognized that the City People's Committee and industrial community should anticipate and overcome difficulties, and barriers ahead…This policy requires an actual performance within 2-3 years, and will be completed in 2004…"*[61]

5.3.2 The relocation of polluting enterprises to industrial zones programme

Introduction

On July 8, 2002, the City People's Committee released decision No.80/2002/QĐ-UB on the approval of the 'Relocation of Polluted Enterprises to Industrial Zones Programme' (hereafter called the Relocation Programme). The programme not only aims to effect an overall greening by solving environmental problems and promoting technological renewal in HCMC's industry, but also by combining the relocation of industries with changes in the city's economic structure and in the spatial organization of residential areas.

The concrete objectives of the Relocation Programme are as follows:

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be listed in the black books since this may have allowed them to request subsidies from the government to reduce their pollution.

[61] Source: Resolution of City's Party No.307-TB/TU dated 14/3/2002

- To move all polluting enterprises, which are not able to engage in on-site improvement, to Industrial Zones and the city periphery by the end of 2004;

- To rearrange the existing production activities that can cause pollution, and reorganise the licensing for new investment projects that are classified as polluting;

- To move small-scale handicraft enterprises to form handicraft villages and to create patterns of large –scale, stable operations, which are able to compete in the context of regional and global integration;

- To develop Industrial Zones in HCMC, which adhere to the required planning.

The integrated Relocation Programme applies to the whole city and includes various measures and activities, which will be discussed in detail in later sections.

The main responsible institutions for the Relocation Programme

Focusing specifically on HCMC's industrial relocation programme, it is clear that the institutional set-up is relatively complicated. The Relocation Programme is officially carried out by the PC of HCMC and directed by a Steering Committee (chaired by the vice-chairman of the People's Committee with the deputy directors of the Department of Industry (DOI) and DOSTE acting as vice-chairpersons). Formally this Steering Committee develops, monitors and supports the Relocation Programme implementation. The Steering Committee holds the final authority to decide whether a certain industry needs to be relocated (or if on-site modernization will suffice), what the new location will be and which support the city will grant to the moving industry.[62] Under the leadership of the Steering Committee there are three divisions that have separate, yet sometimes overlapping responsibilities in the subsequent stages of the Relocation Programme: the Basic Investigation Division, the Urban Planning Division and the Financial Policy Division. Within those three divisions, various governmental departments and organizations are involved, as illustrated in Figure 5.1. Their tasks and activities will be described in the next paragraph.

[62] However, relocation of the centrally state-owned industries cannot be decided by the Steering Committee, but should be discussed directly with the Ministry of Industry (MOI).

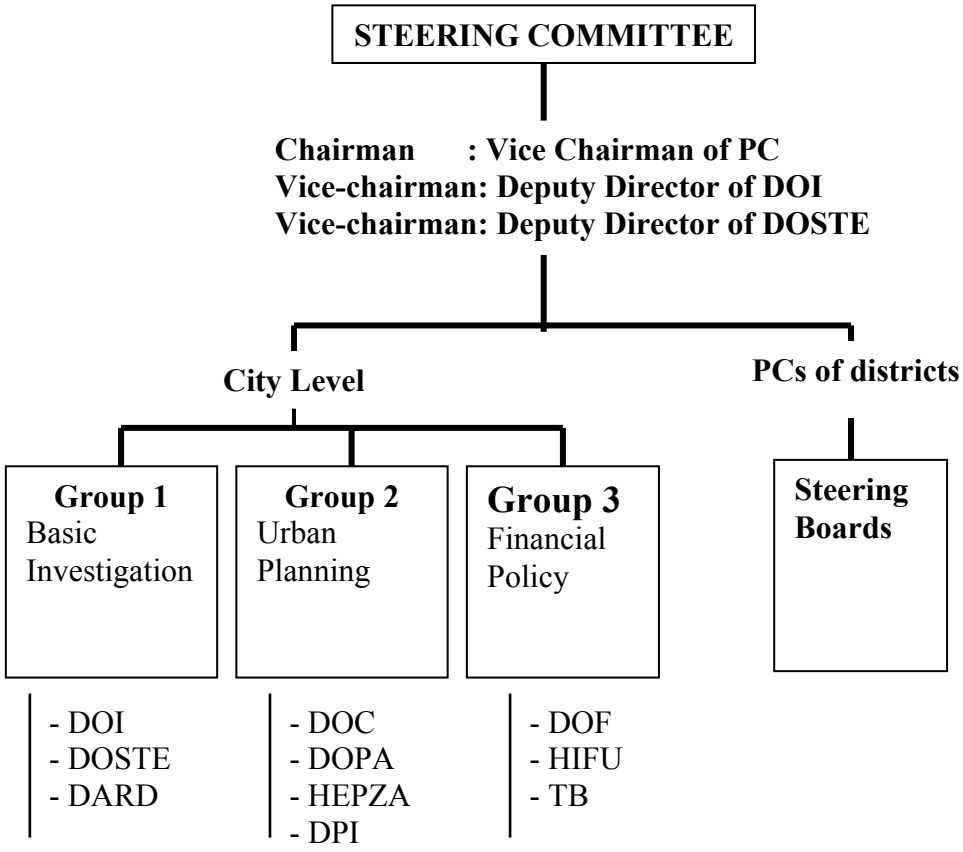

Figure 5.1 Institutional structure of the Relocation Programme

(Source: People's Committee, 2002)

The responsibilities of the different key actors and institutions in environmental management as well as their responsibilities in the Relocation Programme are highlighted below:

The Ministerial and City authorities who own enterprises in the city have to take responsibility for asking and directing their polluting enterprises to relocate the production facilities.

The PC's districts are responsible to co-operate with the Steering Committee to develop local Relocation Programmes in their areas and to promote the relocation of polluting SMEs. The district authorities mostly deal with small and medium-sized industries, since most large-scale industries are internationally or state-owned and thus the responsibility of higher-level authorities.

The City's Department of Finance (DOF) prepares and implements a financial incentive policy to support and encourage the polluting industries to relocate to IZs.

The City's Department of Industry (DOI) is responsible for industrial management of the enterprises of HCMC. DOI forms the Executive Board of the Steering Committee (see Figure 5.2). DOI co-operates with DOSTE and the PCs at district level to contact

the industries about the Relocation Programme. After having received feedback from industries, they send their final proposals to the Steering Committee.

DOSTE (now Department of Natural Resources and Environment-DONRE) executes the state function of environmental management, is responsible for the administrative punishment and penalty, and consults with other responsible authorities to close down the polluting enterprises if allowed by current legislation.

The Department of Planning and Investment (DPI) is responsible for licensing and has to consider carefully before handing out licenses for the operation of enterprises in agreement with the City's master plan. With respect to the Relocation Programme, DPI acts, following advice of DOSTE and the district's PCs, in releasing business licenses regarding to the list of 14 banned industries to operate in urban areas (see Box 5.1).

The Department of Construction (DOC) is responsible for guiding enterprises in completing legislative procedures for the new constructions. DOC is also responsible for directing and supporting the industries in obtaining legal documentation related to the relocation process, and solves all obstacles related to land use and land lease for industries in the relocation process.

The Department of Planning and Architecture (DOPA) is responsible for establishing a spatial master plan of the City, it controls and directs the urban planning process. DOPA co-operates with HEPZA, DOSTE and PCs at district level to investigate the existing IZs in HCMC regarding detailed planning and to plan new IZ areas which can receive the relocating industries.

The HCMC Export Processing and Industrial Zones Management Authority (HEPZA) is the authorised body in charge of activities of all the Export Processing Zones (EPZs) and IZs and is entrusted by the Ministry of Planning and Investment to grant licenses for projects going to be implemented in the EPZs & IZs. With respect to the Relocation Programme, HEPZA prepares the plans to receive the relocating industries and helps them to start operating as soon as possible after the relocation.[63]

The HCMC Investment Fund for Urban Development (HIFU) is responsible for the administering the current incentive scheme (including revolving funds) as well as providing a range of financial services to enterprises located in IZs.

The main procedure of the Relocation Programme

Each district itself has to prepare a local relocation plan, which depends on its own characteristics. The plan mainly contains two components: (1) Current industrial

[63] Although direct regulation still occupies an important part, other perspectives of governance are gradually appearing in environmental policy. Through issuing a new environmental regulation in IZs (based on decision No.76/2002/QĐ-UB on regulation on environmental management in IZs and EPZs, dated 2/7/2002) the City government started a decentralisation process in environmental management from City environmental authority (DOSTE) to a management institution of industrial zones (HEPZA). However the environmental regulation in IZs is only at legalisation level, the success in industrial pollution control in IZs mainly depends on the exertion of HEPZA itself. Besides, HEPZA also needs a financial mechanism to underwrite their environmental management activity. Lesson from Dalian's experience considers a concessionary contracts or management agreements with the private sector may be a way of generating the necessary finance to implement a standard environmental management system (EMS) throughout the IZ sector. In this way HEPZA would assume a more supervisory role rather than an implementation one for which it is currently short of resources (Taylor, 2002).

pollution situation in the district and controlling measures; (2) Relocation plan: the purpose and objectives of the relocation programme, requirements, the list of targeted industries, measures for implementation, the composition of a steering board, schedule for implementation and the list of relocating enterprises in each stage.

The City's Steering Committee has organised various discussions with districts' authorities according to their plan (allowing participating of enterprises and entrepreneurs in the districts). Based on the result of these discussions and the recommendation of Steering Committee members, the Steering Committee will give its comment and guidance in implementing relocation activities in each district. The next step for districts is to make site-visits to the targeted and identified industries of the list and confirm the options (relocating or improving on-site) as well as the concrete needs.

For a number of enterprises belonging to the Ministry of Industry (MOI), the Steering Committee, in co-operation with MOI, carries out the investigations and discussions with a number of polluting enterprises. These enterprises were enumerated in the relocation list[64]. Most enterprises and entrepreneurs agreed with and accepted the City's relocation policy. Depending on their own specific situation, each company has to prepare and compose its plan, either on relocation or on on-site end-of-pipe treatment or on cleaner production approach. These plans have to be submitted to the Steering Committee and MOI as soon as possible after the first visit of MOI and the Steering Committee.

The main procedure and the specific actions that an enterprise has to follow in the Relocation Programme are presented in Figure 5.2 and consist of following steps:

① An enterprise that is identified in the relocation list prepares its relocation plan or project, and submits it to the Executive Board (Department of Industry);

② & ③ An expert team of the Executive Board forwards the relocation plan to a group of experts (at the date of receiving the document). In case of on-site improvement, the company plan is only sent to the Investigation group, which then submits it to the Steering Committee, to decide on. In all other cases, it is send to all three groups.

④ Within 5 days the Investigation group will propose their suggestions (on paper) about the following two issues (that have been investigated already and if the investigation group presents these results and their suggestions) to the Steering Committee:

- Experts of DOSTE look at the cause and level of pollution by the enterprise, and decide whether the enterprise could improve its environmental performance on-site, or whether it has to be relocated (fully or partly), with specified measure for control (if applicable).

- Following DOSTE's recommendations experts of DOI (or experts of DARD for livestock breeding, forestry processing, agricultural and seafood processing) will

[64] Those are Phuong Dong Knitwear company, Phuoc Long Textile company, Phong Phu Textile and Garment company, Thang Loi Textile company, Thanh Cong Textile company, Vifon company, Thu Duc Cooking Oil enterprise, Nha Be Golden Hope factory, Tuong An Cooking Oil factory, Tan Binh Cooking Oil factory, and Sai Gon Brewery company.

make more detailed assessments of techniques, procedures and equipment needed for on-site improvement or relocation of specific industries.

⑤ The Planning Group proposes its suggestions to the Steering Committee within 5 days on two items:

- Experts of the Department of Planning-Architecture (DOPA) (if the relocation site is outside an industrial park) look at the appropriateness of planning and other items related to architectural engineering (density of construction, elevation, border- road map, landmark, etc).

- Experts of HEPZA (if the relocation site is inside an industrial park) look at the appropriateness of planning and of the industrial park's function. Other items related to architectural engineering as well as land rental prices associated with quality and structure of infrastructure is taken into account.

⑥ The tasks of the Financial Policy Group are mostly related to the implementation of incentive- and support policies as designed by the Department of Finance (DOF). In practice this largely boils down to the provision of financial advice and services to (potential) relocators. This group proposes to the Steering Committee within 5 days on following issues:

- Experts of DOF look into the applicability of the financial support policies of the City (spend budget which is gained from selling state-owned enterprises, loan capital, loan rate, etc).

- Experts of Tax Bureau advice on preferential tax-opportunities, expenses for land lease, fee of land use, etc.

- Experts of State Bank and HIFU play a major role in assessing investment credit support (including ability of credit provision, rate, loaning duration, and credit organisation (in case the proprietor needs a loan from a credit organisation)).

- Experts of DPI will evaluate the general aspects of the project, consisting of goal/aim, total investment capital, budget capital and the amount of capital subsidised around 30% of investment capital, financial analysis, economic-social effectiveness/benefit, as well as special policy support for each project.

⑦ The expert team of the Executive Board synthesises remarks and comments from all the expert groups for reporting to the Executive Board of Steering Committee.

⑧ The Steering Committee produces an official statement to the City People's Committee (and DPI) for approval on the following issues:

- The pollution reduction plan of the enterprise. It should be decided on whether to improve on-site or whether there is a need to be relocated (fully or partly relocation, or associated with modernisation); implementing schedule;

- The relocation site if relocation is an option;

- Supporting policies from the City (if applicable), such as those on capital investments, interests on loans, tax regimes, land rent, and labour cost.

⑨ Based on the recommendation from the Steering Committee, DPI will make a project appraisal and submit it to the People's Committee for approving the relocation project, including supporting policies of the City (for group B and approved by the City). This procedure takes place within 7 days after receiving the recommendation from the Steering Committee.[65]

DPI preliminarily appraises projects belonging to group A (state-owned enterprises that are administrated by the City). DPI then submits its appraisals to the PC for consideration and finally, the produced statement is submitted to the Prime Minister for approval.

⑩ The City PC publishes an approval statement for the relocation plan of the enterprise as well as for supporting policies of the City.

⑪ Based on the approved statement of the relocation plan and supporting policies of the City PC, DPI takes responsibility for project appraisal to group C.

[65] The investment projects (exclude foreign direct investment (FDI) projects) are categorised into three groups A, B and C according to its total investment capital and investment field (see detail in Appendix 2); Projects belonging to group A are approved by the Prime Minister, projects belonging to group B are approved by the City People's Committee and projects belonging to group C are approved by DPI; These projects are characterised by (1) state-owned enterprises that are administrated by the City; (2) receiving national budget capital.

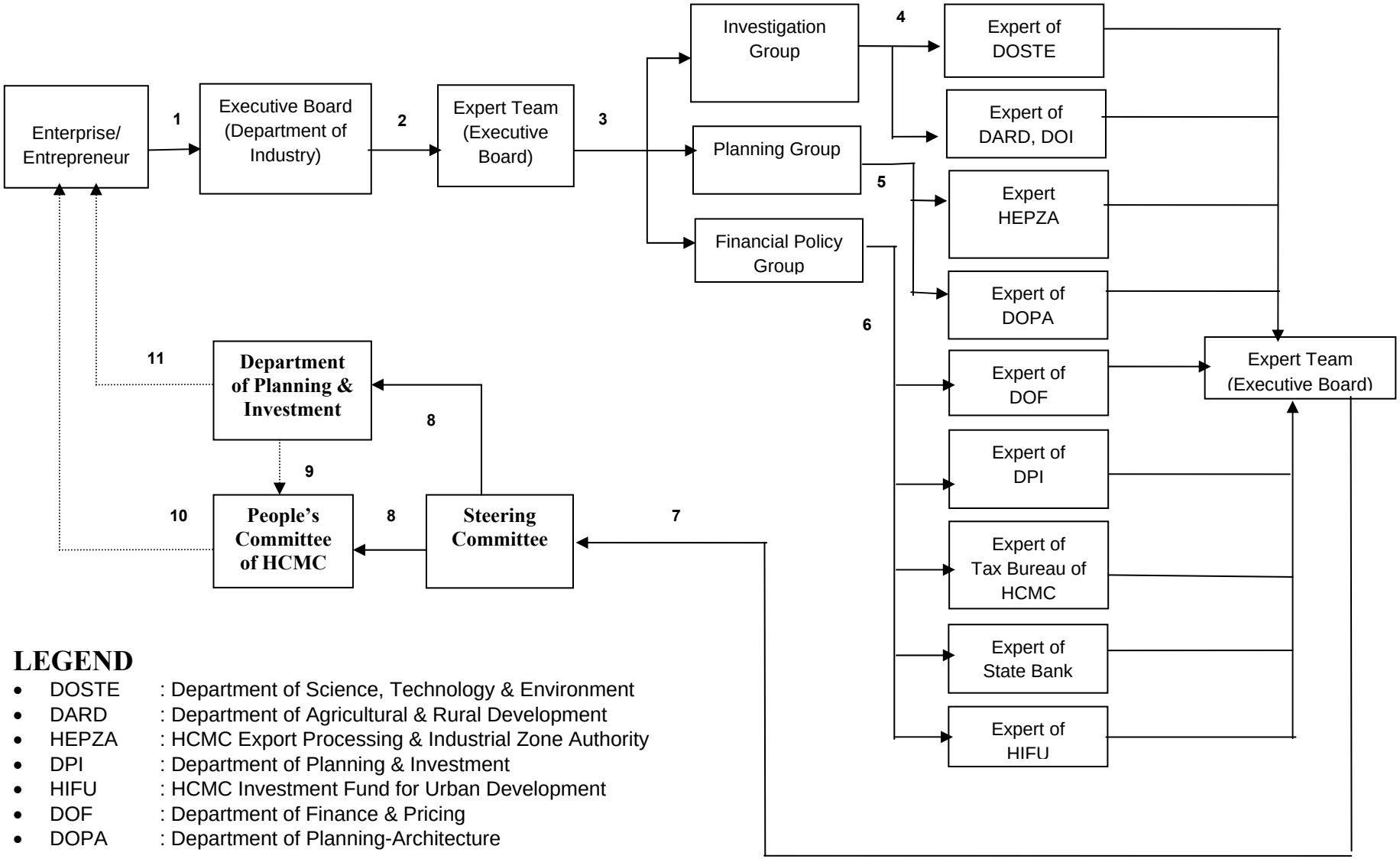

Figure 5.2 Procedure of the Relocation Programme

Investigating pollution sources and defining relocated enterprises

In starting the implementation of this policy programme, surveys were conducted by DOSTE and district's PCs, to identify the major polluting industries, from February to May, 2002. After analysing these data, supplementing them with some on-site investigations and discussing with local authorities, the results indicated that, so far[66], the whole city has about 3,000 polluting industries of which over 1,200 have to be removed. Around 260 premises with heavy pollution from dust, odours, wastewater, air emissions and other forms have been relocated in the first period of the Relocation Programme, 2002-2004. The others have to be relocated to industrial zones in a prospective second period of the Relocation Programme, which has not yet been determined, or in-situ end-of-pipe treatment or/and cleaner production technologies have to be applied.

The guideline of the Ministry of Science, Technology and Environment (MOSTE) is used for relocation criteria. Enterprises with emissions higher than the approved standards are selected for relocation. According to MOSTE's suggestion, these enterprises are listed on three characteristics. First, the location of the enterprise is not in agreement with the general urban planning of the city and district, which means that the enterprise is located in the residential areas and belongs to the industrial sectors that cause severe environmental pollution (such as hazardous wastes). Second, the enterprise uses wholly or partly out of date technology and equipment, lacks waste treatment facilities, and fails to meet environmental standards. Increasing (environmental) investment rates will not likely lead to efficient operations. Finally, the enterprise is not operating economically effective. The company does not make sufficient profit to re-invest and improve the environmental quality.

Establishing relocation policies and measures

In addition to commanding individual industrial enterprises to remove into industrial zones, the HCMC authorities have announced 14 categories of industrial production, which will not be given licenses for new business establishment in the residential areas of the city (Box 5.1.)[67]. The implication of this decision is that existing enterprises within these branches and operating in the inner city should eventually follow the relocation plan of the City. They may also be closed down if there is any claim against the tenants for polluting the environment.

[66] Up to August 2003 (Source: DOI, 2003).

[67] Source: PC, 2002. Decision No.78/2002/QD-UB dated 08/6/2002 on announcement of the list of industrial sectors not be issued new investment license or certificate of trading. This list will be also revised and complemented in coming time.

Box 5.1. 14 categories of industrial production, which will not be issued a license for new business establishment in the inner city *(according to the City Decision No. 78/2002/QD-UB issued on July 8, 2002).*

1. Chemicals (producing basic chemicals, batteries and cells, plants protection chemicals, refrigeration chemicals, aluminium sulphate, detergent, dyes, paint and pharmaceutical materials);
2. Waste recycling (paper, plastic, metal);
3. Fabric bleaching and dyeing;
4. Rubber vulcanisation;
5. Leather tanning;
6. Electroplating and metal forgery;
7. Pulp production;
8. Producing construction materials, pottery, porcelain and glass;
9. Wood processing;
10. Producing and processing fresh food, sauce, salt, cooking oil, alcohol, liquor, beer and soft drinks;
11. Cigarette production;
12. Industrial breeding of livestock;
13. Animal slaughtering;
14. Coal processing.

Financial incentive policy

To encourage faster relocation of polluting industries to industrial zones (IZs) and planned areas before 2005, HCMC's authorities have proposed several incentives.[68]

First, assistance for the investment of new constructions, which include: facilitating the employment of capital which is collected from selling the old (state-owned) land and supplying loans with low interest for state-owned enterprises (SOEs) only which have operated before the Law of Environment Protection was effective (1994) (hereafter called Group 1). The City PC will financially subsidize the interest of the loan for investing in new constructions. Accordingly, regardless of how much the original interest of the loaning source is, the City will subsidize the annual interest rate up to 3 - 4% of the loan, the remaining rate of the interest will be covered by the enterprise itself. The subsidizing rate of the interest depends on the time of the relocation: If the enterprise relocates its production in 2002, the subsidizing rate of the interest (i.e. compensation rate) should be 4% of the loan per year; if in 2003, it should be 3.5% and if in 2004, it should be 3.0%. Beside, loans used to build houses for workers will be given a subsidizing rate of the annual interest of 3% for three years, while loans for the construction of roads to new IZs, of sewage treatment plants and of public works will be free from interest rates for five years.

Second, incentive policy aims preferential taxation (only applied for Group 1). Exemption from land rental charge (if the enterprise rents land) for three years starting at signing the contract for land rental. In case the enterprise employs at least 100 workers on a yearly basis, the exemption will be extended for six years. The business income tax is only 25%. The enterprise will be exempted from paying taxes for two

[68] Source: PC, 2002. Department of Finance-Pricing prepared a proposal of financial incentives to encourage and support relocators. The proposal was approved by the decision No.81/2002/QD-UB dated 08/7/2002 of People's Committee.

years, and it will have to pay only 50% for another two years (four years for enterprises with more than 100 staff). Businesses will enjoy a one-year tax exemption and 50% reduction for the next four years for the part of their incomes generated from expansion or new technology-intensive projects. Imports of equipment and technology unavailable in Viet Nam will be free from import tax.

Third, incentive policy aims to arrange the relocating site of the production and the new settlement of the staff and workers. To change the structure of labouring resources of the City, as well as to increase the rural income, and decrease the natural migration to urban areas, the City encourages industries to employ local people of the community by subsidizing these industries with a rate of 300,000 VND/employee/year (only for employees who are employed from 2002 to 2004). This subsidy has to be used by industries to train their new employees.

And finally a special fund has been established to supply financial awards to industries that actively participate in the relocation program. This fund is not only designed to prize relocators, but also to speed up the relocation process. According to their size, relocators could receive direct financial awards varying from VND 30,000 to 500.000 (US$ 2,000 – 32,000) if they had completed their relocation to a new site in 2002. For industries that completed their relocation process in 2003 or 2004, the awards were reduced to respectively 50% and 30% of the awards granted to similar sized industries in 2002. See details in Appendix 3.

To implement this financial support a fund was created. It is developed according to the motto 'both the Government and industries have responsibilities'. Apart from industry investments - its own capital (acceptance of function changes, selling properties and obsolete machinery in order to create new investment capital) and loans - the City government allocates approximately VND 200 billion (US$ 13 million) per year from its budget to compensate the interest of loan for carrying out both relocation and implementing pollution reduction at site.

Planning of industrial zones

The HCMC government has speed up the process of compensation, clearance, and investment and construction of 14 industrial zones and small-scale industry areas. At present[69], HCMC has been promoting the following activities: investment and construction of industrial zones serving relocation such as Hiep Phuoc industrial zone; extension of Le Minh Xuan, Tan Tao and Vinh Loc industrial zones; re-planning of Tan Phu Trung and An Ha industrial zones; search and identification of areas for construction of small-scale industrial areas or handicraft villages in districts.

[69] August 2003 when this research was performed.

Box 5.2 Experience of a sectoral association: Self planning

Faced with some difficulties in relocation, such as high land rental prices, lack of leased land, uncompleted infrastructure (roads, water supply, and electricity) and administrative procedures in HCMC's IZs, plastic enterprises and their sector association (HCMC Plastic Association-HPA) detected their own solution, without waiting for the guidelines and support from the City authority. In this way, thirteen plastics producers in HCM City and the HPA together have built their own production complex in Long An Province, west of HCMC.

According to an article in the Vietnam News (27/3/2002), the plans for the 54ha complex include factories producing plastic packaging, high-quality plastic goods, plastic footwear, and PVC tubes and moulds. The project will meet the relocation and expansion requirements of plastic producers. The manufacturers say the establishment of the industry-focused "cluster zone", known as the Duc Hoa Ha Complex, will be cheaper and more practical than renting land in IZs. "We really wanted to extend our existing plant in Binh Chanh, but it's already overloaded and any growth would lead to lack of space to store our raw materials and finished product", said Thuong Chi Minh, director of plastics packaging company A Chau. "But we can't afford the high rents charged at most IZs. So when the HPA asked us to invest in their plastics complex, we put our hand up for 24,000 sq.m", Minh said.

According to the HPA a dozen other plastic producers, mostly private owned, have also signed up, and by the end of 2002 the entire 54 ha site was almost full. HPA deputy general secretary Nguyen Tat Thang indicated two main reasons for plastics producers to choose the Duc Hoa Ha Complex: the provision of cheap land use rights and the zone's simple, flexible administrative procedures. The price of land at an ordinary IZ is typically US$ 2.54/m^2; but a plastic firm buying one hectare of land from the HPA at Duc Hoa Ha will pay only US$ 5,500 (or US$ 0.55/m^2).

HPA will take care of all paperwork and 'red tape' so that investors can focus on their business only. HPA general secretary Tran Cong Hoang Quoc Trang reported that because the tenants are also the owners, they ensure the complex is built quickly and looked after carefully. Trang revealed that the association has recently received an approval from the Long An People's Committee to expand the complex to 130 hectares.

5.3.3 Preliminary evaluation of the Relocation Programme

Outputs and outcomes of the Relocation Programme up to August 2003

According to DOI (2003), after being carried out for nearly two years, the Programme has achieved a number of results:

- Relocation plans of over 1,000 enterprises are approved, of which 93 units must be relocated prior to 2003;

- 126 units have been relocated up to August 2003 (260 units till end of 2004);

- 56 units have changed their products and over 1,800 units have overcome their environmental pollution at site via end-of-pipe treatment or cleaner production[70];

- According to the first inventory, units relocating to the IZs have newly invested approximately VND 1,000 billion (US$ 64.5 million) including approximately VND 600 billion for basic construction and VND 400 billion for equipment and technology. In addition, they recruited thousands of new labours.

[70] According to the author this figure of 1,800 should be re-evaluated because two years is a very short time for doing so. Maybe this figure was calculated by counting not only in last two year (2002-2003) but in previous years as well.

Mrs. Quach To Dung, Deputy Director of DOI and Vice-Chairman of the Steering Committee, stated that "(so far) the programme has created synchronous and unified changes amongst departments, companies and local authorities. Especially companies have become aware of the significance of the objectives and implementation plan for industrial relocation. Along with production development and job settlement for labourers, social responsibilities and public awareness of responsibilities for environmental protection have been strengthened and increased. The city government has carried out solutions via propagation and training, economic incentives as well as enforcement measures to ensure successful implementation of the programme of environmental pollution reduction and industrial relocation to centralized IZs and surrounding areas…"[71]

Based on this information, our evaluation of the relocation-project is that some progress has been made, as illustrated by the number of supporting policies that have been prepared and implemented, the number of relocation plans that have been approved, the number of businesses that have been relocated or have engaged in the greening of production processes. However, at the same time it is highly unlikely that the relocation targets set by the HCMC authorities will be met before the end of 2004. In the next section we will assess to which extent the current configuration of policy-actors involved in the development and implementation of the Relocation Programme, is hampering the achievements of the Programme.

Policy Network Analysis

In the previous section the general goals and outcomes of the Relocation Programme have been described. Subsequently, we can identify various actors (see Figure 5.3) that influence the implementation of the Relocation Programme.

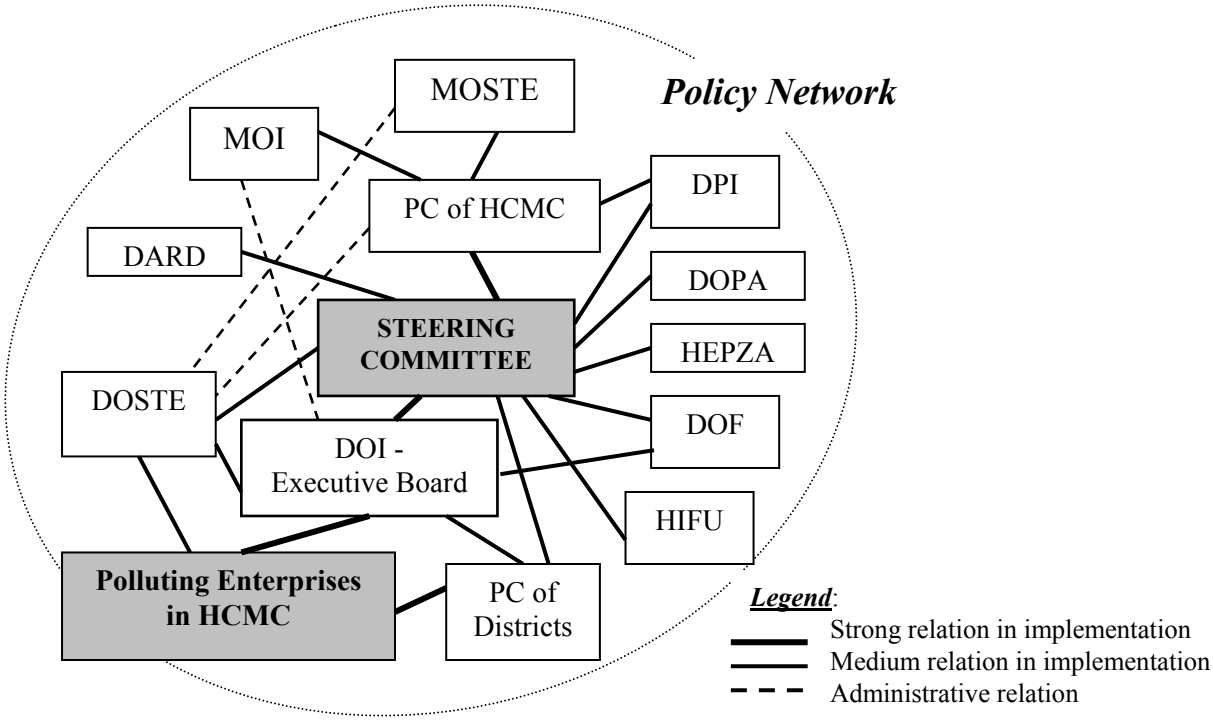

Figure 5.3 Policy network in the Relocation Programme in HCMC

[71] Source: DOI, 2003.

We will look into the respective and interrelated tasks of key actors that are most central to the Relocation Programme: the People's Committee of HCMC, the People's Committee of districts, the Department of Industry (DOI) and the Department of Science, Technology and Environment (DOSTE). In line with the formal organizational set-up of the Relocation Programme the PC of HCMC can be considered a core actor in the actual implementation. The commitment of the HCMC's PC is vital, as the committee employs its authority to pressure different governmental departments to actively co-operate in the Relocation Programme and to mobilize resources for this purpose. The city PC's undisputed authority can often speed up and regulate the behavior of other actors involved in the programme. Previously (see Part 5.3.1), the necessity of the involvement of HCMC's PC was already proven by the failure of independent district-level relocation programs. District-level authorities lacked the backing of the City People's Committee and were thus unable to mobilize the required resources for successful relocation, such as the funds for incentive and support policies, and land for the construction of industrial sites.

The above-described institutional arrangement is the formal structure for the implementation of the Relocation Programme at the City level. However, in practice the district authorities play a crucial role in the concrete identification and relocation of polluting industries. Each district is obliged to prepare a local relocation plan according to the city's master-plan. The relocation plan should take into account the industrial pollution situation in the district and the measures that are already taken to reduce pollution levels. The city-level Steering Committee organized various meetings with district authorities to discuss the drafting and progress of local relocation programmes, and also provided guidance in implementing relocation activities in each district. Usually the Economic Division and the Environmental Group (the latter is part of the Urban Management Division) of a district are jointly executing the programmatic activities, such as on-site visits, pollution measurements and decision-making. If the number of industries that are listed for relocation is particularly high in a certain district a specific management structure, mimicking the city-level structure (steering board) can be established.

However, the downside of the PC's steering power is formed by its traditional proclivity to the use of top-down, state-dominated approaches and instruments, leaving no room for flexibility and fine-tuning. SMEs – representing the large majority of industries involved in the Relocation Programme – have specific needs in the relocation process, related to their limited capital and technology used, or their traditional relationship with customers and suppliers. Relocation of these smaller industries will benefit from regulations that allow more room for individual variation and needs, than the generic regulations that are part and parcel of the PC's policy style. A case in point is the overall obligation for all concerned industries to relocate by 2004. This demand has been proscribed without taking into account the availability of suitable alternatives for various sectors of industry. In the following section we will see how this posed problems to many dyeing enterprises, as the construction of industrial zones that fit their requirements is still on-going and not expected to be completed within the set time-limits.

At a more general level, the obvious haste of the City People's Committee to complete the relocation process does not contribute to a smooth implementation of the

Relocation Programme. Not only is it impossible to prepare all 'hardware', such as adequate industrial zones in time; the forced speed has also resulted in hampered 'software', in terms of under-developed support policies and unclear procedures within concerned government departments. DOI has for example been assigned a rather central position in the relocation program as the main executing agency. DOI is charged with the preparation of proposals for relocation (or on-site improvements) and for communicating these plans to the concerned industries. Thereby DOI seems to take on some tasks, which in terms of content, might be better left to the environmental experts of DOSTE. This central position of DOI seems to be more the result of informal politics, than of a logical consideration of various departmental capacities. On the one hand, this quaint task-division relieves the already overburdened DOSTE of some of its workload. On the other hand, however, we see that most of DOI's staff lacks the required experience in the field of environmental management to adequately perform the duties assigned to them. In addition, considering the short time-span of the Relocation Programme, the time to obtain relevant environmental knowledge and skills is extremely limited.

Although some of DOSTE's 'natural' tasks have been transferred to DOI, the environmental department remains responsible for the enforcement of environmental regulations, checking of environmental licenses and the monitoring of pollution levels caused by potential relocators. These duties are mostly performed via a traditional command-and-control approach. However, recently DOSTE has also initiated more communicative and supportive approaches in, or related to the Relocation Programme. One example is the promotion of cleaner production for various sectors of industry, to enable enterprises to apply on-site improvements as an alternative for relocation. Another example is the publishing of Black Books of polluting enterprises and of the Green Book of 'green' enterprises in HCMC. In general, we may conclude that DOSTE is striving to take on more pro-active and flexible roles in the Relocation Programme rather than merely enforcing environmental legislation. However, so far the actual results of additional innovative approaches have been limited. Due to severe understaffing, financial constraints and poor management DOSTE's activities are in practice more or less confined to reacting to requests from the HCMC's PC or to citizen complaints (cf. Frijns et al., 2000; O'Rourke, 2002; Le and Tran, 2003).

5.4 CASE STUDIES: RUBBER ENTERPRISES AND DYING ENTERPRISES

In order to understand the Relocation Programme implementation, which is in progress, this part focuses on two industrial sectors in two districts. By analysing in detail how these sectors have been confronted with the Relocation Programme, how they reacted towards it and what have been the final relocation results, we are able to get a more detailed and refined picture of the successes and constraints of the Relocation Programme.

5.4.1 Selection of the case studies

The case study is conducted through the investigation of five rubber enterprises located in District 11 and 16 dyeing enterprises located in Tan Binh District, Ho Chi

Minh City[72]. Interviews have been held with industry owners, government officials of DOSTE, HEPZA and PC of the districts where these enterprises are located (see for list of interviewees Appendix 4).

There are five reasons for selecting the rubber industries in District 11 and the dyeing industries in Tan Binh district. First, these sectors, as well as the selected industries in these two sectors, are characteristic and representative for polluting SMEs in District 11 and Tan Binh District, with respect to size, ownership and production process. Second, they belong to the type of industries that cause most serious environmental problems, and which have to relocate according to the list of 14 types of industries to be banned from residential areas in Ho Chi Minh City (see Box 5.1). Third, all 21 enterprises are being forced to relocate in 2003 or 2004, according to governmental stipulations; at the time of investigation, some of these enterprises had relocated successfully in the past, while others still needed to be relocated. Fourth, **c**omparing and contrasting the two specific sectors could be very helpful in clarifying the similarities and differences in how these SMEs react to the Relocation Programme. And last but not least, these enterprises have been willing to be interviewed and investigated, making information extraction and assessment possible.

5.4.2 Overview the relocation programme in Tan Binh District and District 11

Tan Binh district [73]

Tan Binh is an inner district with an area of 38.45 km^2 and a population of 657,000 people (in 2001). Tan Binh is considered the main industrial district of HCMC, with many industrial activities (both small scale and large scale). Statistically, at the end of 2001, besides 82 state-owned enterprises, and foreign-invested enterprises directly under central government and city government, Tan Binh had 5,131 industrial enterprises, including six state-owned enterprises, eleven co-operative enterprises, 216 limited-trade companies, 114 private companies, and 4,810 family-based enterprises, together employing about 50,000 labourers. Besides, Tan Binh industrial park had 93 enterprises that hire land, of which 36 enterprises were operating. From 1996 to 2000, the industrial production in Tan Binh had increased with an average of 15% per year. In 2001, the total value of industrial production of Tan Binh District was VND 3,289 billion (US$ 219 million). It rose 17.6% as compared to 2000 and constituted 18.2% of the total industrial production value of private enterprises of HCMC. The economic development of Tan Binh District has not only contributed to the budget of the district, but also created many jobs for residents in the district and city. The industrial and commercial tax of Tan Binh forms 65-70% of the total income of the district and Tan Binh industrial enterprises have attracted over 10,000 new labourers per year over the last years.

In 1998, Tan Binh District started a relocation program by itself by surveying, investigating and listing the polluting enterprises located in this area and stimulating the most polluting ones to move to IZs. At the end of 2001, 387 enterprises relocated

[72] The investigation happened from March 31, 2003 to May 15, 2003. At the surveying time, there were 10 rubber SMEs in District 11 and 25 dyeing SMEs in Tan Binh District (Source: Environmental division of Tan Binh and District 11).

[73] Source: Report 2002 of the Urban Management Division of Tan Binh District

to IZ or were closed by the PC of Tan Binh District. That was a significant effort of the Tan Binh authority. However, the annual increase of the number of polluting enterprises in this district has caused many environmental complaints from the residents who must live in an environment polluted by wastewater, solid wastes, hazardous gas, noise and air pollutants from these SMEs. Until now, while conducting the Relocation Programme, 399 enterprises are required to relocate before 2004, because of their serious environmental pollution. Others less polluting will be relocated in the following years. In order to facilitate this task, Tan Binh District has conducted some community-based interviews in which the enterprises and the related authorities sat together to discuss a better solution for the relocation process. However, so far (the end of 2003) in this programme only 51 SMEs were moved to the suburban areas.

District 11[74]

District 11 has a natural area of approximate 5.15 km^2 or 515 ha in which Dam Sen Park and Phu Tho Racecourse take 100 ha and 415 ha residential area. District 11 borders with Tan Binh District, District 10, District 5 and District 6. The population of District 11 is about 241,000 people (in 2002). In 2002, the industrial production value of District 11 had reached VND 2,080 billion (US$ 138 million), an increase of 7.94% compared to 2001. The total industry income in 2002 was VND 2,155 billion (US$ 144 million), an increase with 10.1% compared to 2001.

The area of District 11 locates 3,234 SMEs. These enterprises create 20,000 jobs for local residents, but are also sources of environmental pollution. Statistically, following the Relocation Programme there exist 600 polluting enterprises that have to be relocated before 2004. However, only 40 SMEs in the whole district have implemented the Relocation Programme (up to August 2003) and the others are still immovable.

5.4.3 Assessing the Relocation Programme implementation for SMEs

Profiles of the Rubber and Dyeing SMEs

Based on the case studies at five rubber SMEs in District 11, 16 dyeing SMEs in Tan Binh District[75] and from information and interviews with several governmental agencies, some significant characteristics of these SMEs can be highlighted.

Most of the SMEs are small-scale or family scale, with 5 to 90 employees, and an average of 14 employees (in rubber industry) and 32 employees (in dyeing industry). The ratio of employee/staff in these industries is around 10-12. There is a difference in needs of production area between rubber and dyeing industries. The average area of a rubber enterprise is about 270 m^2, while that of a dyeing enterprise is about 1,500 m^2. Another difference is the total investment, which varies from VND 154 million (US$ 9,900) in the rubber industry to VND 3,534 million (US$ 228,000) in the dyeing industry (see Table 5.1). These differences explain distinction between their attitudes to Relocation Programme (see below).

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[74] Source: PC -District 11, 2002

[75] Including a case of Branch No.2 of Xuan Huong Ltd. Company, which has 400 employees and is thus not a SME (based on definition of SME of Protocol No 90/2001 of Vietnamese Government)

Table 5.1 Production characteristics of Rubber Industry and Dyeing Industry

Characteristic	Rubber enterprises	Dyeing enterprises
Number of employees	7 - 40 ; average: 14	5 - 90 ; average: 32
Employee/staff ratio (average)	10	12
Existing production area (m^2)	100 - 500; average: 270	150 – 4,725; average: 1,500
Total investment (million of VND)	60 - 300; average: 154	105 - 20,000; average: 3,534

Most of these SMEs are specialized in certain productions. Being located in crowded residential areas of HCMC, they are close to the markets and sources of material supply. Situating there has leaded to strong reactions of surrounding communities putting heavy pressure on these SMEs to relocate. Due to family-scale characteristics, their living area is often the same as the working place. Thus, employees will be the first persons affected by environmental pollutants from their operations. The production technology and machines of these SMEs are mostly obsolete and simple and emit relatively high levels of pollutants to the environment. Released pollutants are often wastewater, bad odour, noise, air emission (SO_2, NO_x, CO), dust and so on.

The entrepreneurs indicted a number of basic difficulties that they are facing in their business activities (Table 5.2).

Table 5.2 Basic difficulties in interviewed SMEs

No	DIFFICULTIES	Mentioned by % of SMEs
1	Existing production area is too small	48
2	Lack of competitive capability	43
3	Unaffordable waste treatment facilities	43
4	Business expansion is impossible due to lack of capital	43
5	Out dated equipment and technology	29
6	Profit margin is too small	29
7	Cost of production is too high	29
8	Management skills and knowledge is not highly developed	5
9	Other difficulties	19

The most obstacles in production development of the dyeing enterprises are related to investments for production enlargement, building of treatment facilities, limitation in production area and land use rights, and enhancing competitive capability. Those of rubber enterprises are related to enhancing competitive capability and limitation in production area and land use rights.

Most of the enterprises (18 out of 21) have not yet joined any industrial association. The remaining ones (3 out of 21) are members of the Viet Nam General Corporation

for Textile and Garment (VINATEXT) or the Vietnam Saigon Plastics Association (VSPA). Table 5.3 reveals the organisations from which the enterprises received technical and financial assistance.

Table 5.3 Technical and financial assistances which SMEs received from different organisations

No	Supports from organisation		Mentioned by % of dyeing SMEs N=16	Mentioned by % of rubber SMEs N=5
1	Governmental organisations	Technical	0	0
		Financial	0	0
2	Private organisations	Technical	18.75	0
		Financial	12.5	0
3	Industrial or Trade associations	Technical	0	0
		Financial	0	0
4	Other enterprises	Technical	6.25	0
		Financial	6.25	0
5	International supports	Technical	12.5	0
		Financial	6.25	0

Based on this table, it can be concluded that the dyeing and rubber SMEs received no technical or financial support from governmental organisations. While the rubber SMEs bear rarely a relationship to outside, the dyeing SMEs seem to be more open in their contacts to different organisations, such as private consultants, Tan Viet Bank, Sai Gon Finance Bank, Houlon Dong Nai Fibre Factory, and Taiwanese, Japanese and Korean textile-dyeing companies.

Environmental profile

Table 5.4 presents the results of industrial wastewater samples that were taken from dyeing SMEs in Tan Binh District. The outcomes show that pH levels in dyeing wastewater varies considerably from 4.5 to 11.6; COD concentration is high and varies from 684 mg/l to 6,840 mg/l; and BOD_5 concentration varies from 116 mg/l to 1,388 mg/l. However, suspended solid (SS) concentration is low, between 5 to 218 mg/l and heavy metals concentrations, such as cadmium and chromium, are very low. Compared with Vietnamese environmental standards TCVN-5945-1995-C[76], all wastewater samples did not meet the standards for COD and BOD_5.

[76] Wastewater quality must meet these standards before being discharged into public sewerage system.

Table 5.4 Quality of industrial wastewater from dyeing SMEs in Tan Binh District in 2001

	pH	COD (mg/l)	BOD_5 (mg/l)	SS (mg/l)	Colour (Pt-Co)	Cd (µg/l)	Cr^{6+} (mg/l)
Range of concentration	4.5 - 11.6	684 - 6,840	116 - 1,388	5 - 218	765 - 20,165	0.33 - 1.5	0.00015 - 0.036
Average concentration		2,604	619	44		78	0.013
Vietnamese environmental standards TCVN-5945-1995-C level	5-9	400	100	200		500	0.5

(Source: Tan Binh People's Committee)

Table 5.5 Air emission quality[77] from dyeing SMEs in Tan Binh District in 2001

	Temp. (oC)	Dust (mg/m^3)	SO_2 (mg/m^3)	NOx (mg/m^3)	CO (mg/m^3)
Range of pollutant concentration	78 - 407	22 -226	1,420 - 4,812	186 - 626	10 - 473
Average concentration		166.3	3,452	529	95
TCVN-5939-1995 -A - applied for enterprises who started operation before 6/3/1995		600	1,500	2,500	1,500
TCVN-5939-1995-B - applied for enterprises who started operation after 6/3/1995		400	500	1,000	500

(Source: Tan Binh People's Committee)

[77] Measured in the boiler's chimney of enterprises

Table 5.5 presents the results of air emissions quality monitoring from some dyeing SMEs (most of which started operating before 6/3/1995) in Tan Binh District[78]. It reveals that only in enterprises with a treatment facility, SO_2 concentrations meet the standard TCVN-5939-1995-A.

Another indicator for high pollution caused by SMEs is the environmental complaints of surrounding inhabitants send to authorities, as recorded from the start of operation up to 2003 (see Table 5.6).

Table 5.6 The number of complaints[79] on environmental pollution caused by rubber and dyeing SMEs

Number of complaint times/enterprise	Rubber enterprises	Dyeing enterprises
None	2	10
1- 4 times	3	6
5 - 10 times	-	-
> 10 times	-	-

Attitudes of SMEs to the Relocation Programme

All the 21 case study SMEs have received information related to the Relocation Programme, either through state agencies (21/21), sectoral associations (2 out of 21) or public media (4 out of 21). Most of the SMEs (19 out of 21) recognise their severe contribution to environmental pollution. Compared to relocation, 11 out of 21 enterprises would choose a technology improvement approach, while 15 out of them would prefer an end-of-pipe treatment approach.

If accompanied with a number of advantages such as less interruption from authorities, stability in production, not being removed in future, and financial support in many aspects (land rental, tax, subsidies), over 50% of the enterprises (13 out of 21) agreed to the instruction and assignment from authorities for a planned relocation site.[80] Remaining SMEs (8 out of 21) preferred to choose a relocation place themselves, being more suitable to their own conditions and needs (sites at closer distance, better availability of water supply, etc.)

[78] Similar data of rubber SMEs in District 11 are not available.

[79] These complaints were sent to District authorities by surrounding inhabitants. Direct complaints to enterprises are not recorded.

[80] This has been accomplished in Tan Binh District for the dyeing industry through a 'community-based approach'. The district's authorities (including Division of Economy, Division of Urban Management and Management Board of Tan Binh IZ, and DOSTE) arranged many open discussions with dyeing SME owners discover the best way to relocate this sector. This provided the SMEs with opportunities to give their ideas and choices and at the same time the authorities received feedback from the enterprises to adjust their implementation programmes effectively. As a result, Tan Binh IZ will be expanded with 68 ha of land to build a cluster for dyeing SMEs, which belong to Tan Binh district. There, a central industrial wastewater treatment plant will be established and operated by an organization which represents both the Management Board of Tan Binh IZ and the group of dyeing SMEs. A service fee will be paid by the enterprises. This approach regenerates a production area in the inner city and allows the people involved in small and family-scale enterprises to remain within the geographical vicinity of their residences.

Relocation was also expected to have several impacts on the SMEs. Table 5.7 reveals some expectations of the impacts when relocated to industrial zones. Most of the SMEs indicate that relocation will be an opportunity to enlarge their production scale (90%) and to increase their production area (86%), while they also expect interruptions of their production (81%). Impacts of the relocation on their benefit and profit (e.g. more transport cost, more construction investment) as well as the relations with customers (e.g. could not satisfy the demand of customers right away) have not yet been recognised or identified clearly by the interviewed enterprises. Their anxiousness of loosing skilled workers and technical staff is not high (33%), because the relationships between employees and owners in small-scale or family-scale production units is very close.

Table 5.7 Impacts to dyeing and rubber SMEs when relocating to industrial zones

No	Impact	Mentioned by % of SMEs
1	Chance to enlarge production scale	90
2	Increasing production area	86
3	Profit: - Increasing	48
	- Decreasing	24
	- No changing	19
4	Benefit : - Increasing	38
	- Decreasing	29
	- No changing	24
5	Amount of customers : - Increasing	29
	- Decreasing	33
	- No changing	29
6	Interrupt production	81
7	Loose skilled employees	33
8	Loose technical staff	24

When asked about the conditions, under which they would participate in the relocation-scheme, most respondents (81%) suggest a preferential loan; tax reduction and an acceptable price for leasing land in IZs are second in rank among their expectations (71% of respondents). Other requested conditions are completed infrastructure in IZs (57%), reasonable schedule for relocating (57%), relocation of enterprises in the same sector should happen at the same time (48%), and fair enforcement of the Law (38%) (see Table 5.8).

Table 5.8 Needs of SMEs for successful participation in the Relocation Programme

Support and Incentive	Mentioned by % of SMEs
Preferential loan	81
Tax reduction	71
Attractive price for leased land in IZs	71
Completed infrastructure in IZs	57
Reasonable schedule to relocate	57
Relocating at the same time	48
Fair enforcement of the Law	38

The respondents also revealed the preferential strategies in order to control industrial pollution if they would not relocate. All rubber SMEs preferred end-of-pipe treatment measures while only 63% of dyeing SMEs chose to do so. Beside, 60% of former group accepted upgrading of technology and machinery, while 50% enterprises of the dyeing group did.

5.4.4 Sub-case studies: Closer view into enterprises

In order to supplement the understanding of the relocation issue of SMEs, two in-depth, case studies were done: TT enterprise, a typical dyeing SME (in both production technology and socio-economic elements) in Tan Binh district, and VK enterprise, a representative of small-scale rubber production in District 11.

5.4.4.1 TT dyeing enterprise[81]

TT is a dyeing SME in Tan Binh District, situated in a residential area that belongs to Ward 13. Its total area is 1050 m^2, of which 966 m^2 is used for production. It operates 30 days per month. In 2002, 68 employees and 5 managers were employed in TT. Its annual production capacity is 2,600 tons of dyed cloth. Total investment is VND 10,000 million (US$ 645,000).

Description of the dyeing processing

TT uses a batch dyeing process (see Figure 5.4). First, undyed fabric, which is supplied by customers, is rinsed to lift off soil, dust, grime, grease and other matter (here, TT does not use NaOH to bleach cellulosic matter called 'weight reduction' as is done by other dyeing enterprises). Then the fabric goes in high-pressure dye becks to react with dyes. The temperature in the dye beck may rise to 130^oC. There are 8

[81] Information gathered through questionnaire response, face-to-face interview with its manager, Mr. PC Dong, and site visit.

second-hand dyeing machines[82], which are imported from Taiwan. The dyes used vary considerably, depending on the type of fabric and on the desired final characteristics (for example, solid colour or prints). The fabric then passes through a series of washing stages to remove unbounded or un-reacted dye before it goes through a centrifuge machine to remove the water. A boiler with steam capacity of 4 tons/hour is used to supply hot steam for the dyeing and rinsing stages. The rinsing happens in the same dye becks. Then the fabric will go through the last stage, drying and curing tender frame. A heat oven is used to supply hot air (up to 170^{o}C) for the drying. Total coal consumption of boiler and heat oven is about 6.5 tons/shift.

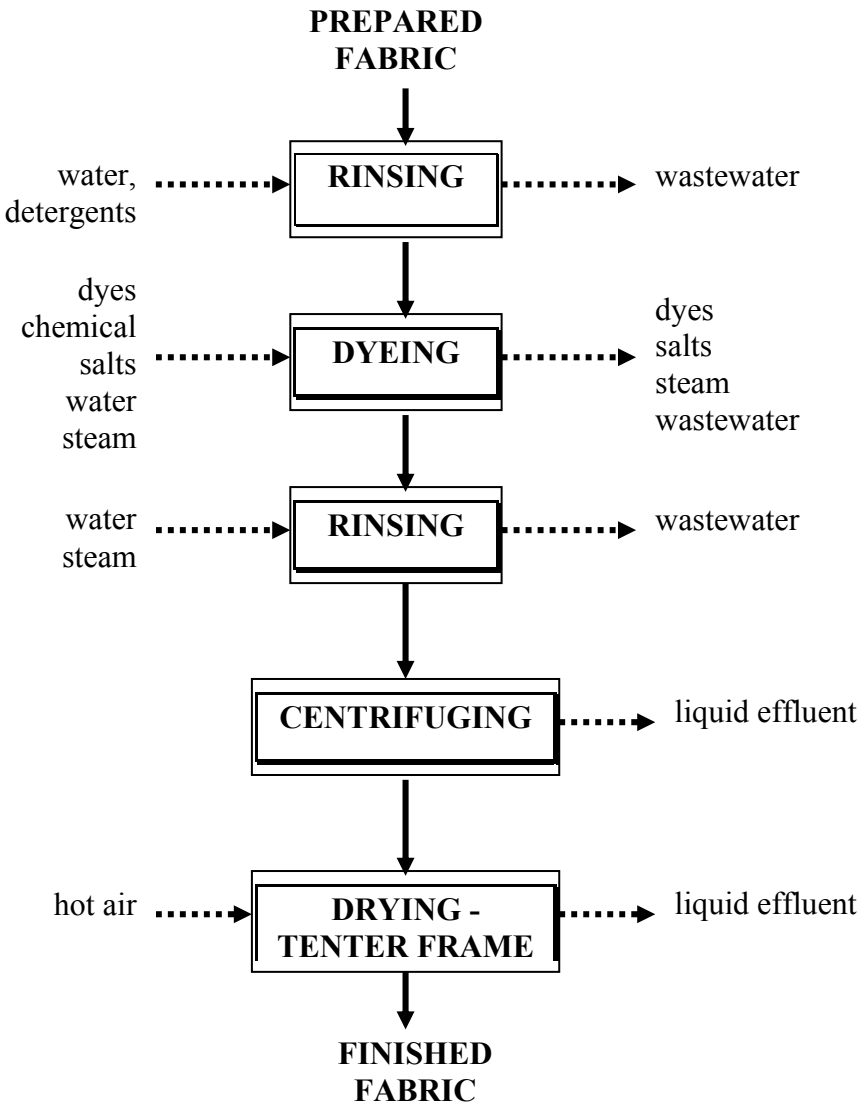

Figure 5.4 Flow diagram of the dyeing process in TT enterprise

Water consumption depends on the type of operation. Water consumption of processing one batch is about 7.5 m^3 of water. Daily water consumption in TT enterprise is 260 m^3 for production and 10 m^3 for domestic use. The enterprise does not recycle wastewater, in order to ensure the quality of the finished fabric.

[82] With capacity 150-300 kgs fabric/dyeing machine or 600-1,200 m^2 fabric/dyeing machine, the operation time of one batch is around 4-8 hours.

Surrounding inhabitants sent three environmental pollution complaints to district 11's environmental authority, especially on the emission of dust and air pollutants from TT. After using coal instead of diesel fuel and installing air filters, the air pollution has been controlled. The enterprise also installed an industrial wastewater treatment facility, which costs VND 150 million. However, it only operated a few months, due to weak enforcement of environmental authorities and high consumption costs for chemicals and electricity. So far, the enterprise has not yet appointed any staff to be responsible for the environmental management.

The enterprise manager stated that the relocation policy (described in Part 5.2) is legitimate and necessary. He considered it a chance for expanding production quantity and production area (even to one hectare of land). He also expected to receive financial assistance for a loan to build a common wastewater treatment plant, for tax reduction, and for low land rental prices from the City government. According to the manager, the relocation should happen simultaneously for all dyeing industries in order to balance competition. A stringent relocation schedule should avoid effects on production. In addition, the Relocation Programme must be prepared carefully, to avoid other relocation in the future. Discussions between Tan Binh People's Committee, TT and other dyeing SMEs in Tan Binh District, resulted in a future relocation of all companies to Tan Binh Industrial Zone by 2004 (described in Part 5.4.3).

5.4.4.2 VK rubber processing enterprise

VK is a rubber processing SMEs in District 11, similar to other rubber processing SMEs. It situates in a residential area belonging to Ward 11. Its total area is 200 m^2 of which 100 m^2 is used for production, while the rest serves as living area for the entrepreneur's family. In 2002, the enterprise employed 7 labourers; the manager of the enterprise is the owner. Its product is rubber thread from which they produce elastic for clothing. Total investment is VND 120 million (US$ 7,700).

From 1975 to 1985, VK produced bicycle tyres. From 1985 up to now, due to market requirements, the enterprise has changed its product to rubber thread. Future increase in production is not very likely due to this small market, which is considered an obstacle in the enterprise's development. At the moment VK is facing competition of other companies. Those with large capital, have invested in modern machines and reduced their product prices. The advantage of VK is its experiences in production. VK has not yet joined any industrial association as it wonders what benefit it could get. It is very rare that family-scale companies join such organisations. In the owner's opinion, joining the Asian Free Trade Area (AFTA) and the international economy will have disadvantages for Vietnamese small-scale enterprises, due to low competition capacity.

Description of the production process (see figure 5.5)

First, latex rubber is rolled, and well mixed with some chemicals such as stone powder, zinc, sulphur powder, etc. Then the mixture is rolled and pulled into thread. The pre-rubber thread will be steamed to sulphurize, to become finished rubber thread. The enterprise uses 2-3 tons of latex rubber per month.

According to the owner, there are very few enterprises in Viet Nam and other Asian Southeast countries which produce the same thread (!). It took him more or less 20 years to find out an optimum production technology with very good elastic quality. So, he is keen to keep his 'know-how' secret, except for his son.

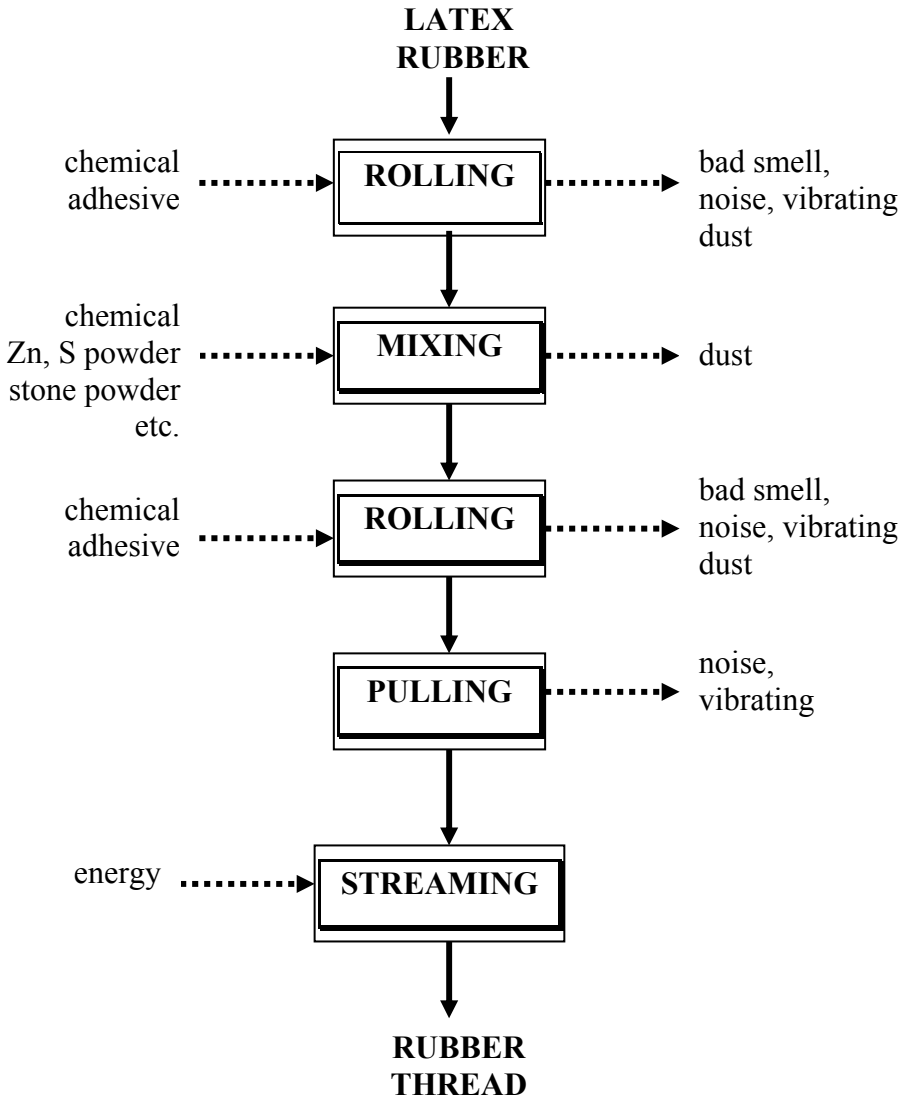

Figure 5.5 Flow diagram of the production process in VK enterprise

Environmental pollution complaints from surrounding inhabitants were sent to the district authorities three times, regarding the emission of dust and vibrations. As a result, Tan Binh PC fined the enterprise two times for administrative violation of environmental protection.

In 1996, to overcome the above pollution problems, the enterprise studied and installed itself a filter system to collect dust. The 4-5kgs of collected dust per day is reused in its production process. Besides, the enterprise also changed its old open wooden doors into glass ones, so that dust produced is kept inside, not affecting the surrounding area. At the same time, the enterprise invested in building an anti-vibration system for rubber rollers. As a result, when rollers are working vibration has disappeared.

Since the end of 1990s, with the understanding that long-term operation is impossible in the inner City, the enterprise itself has planned to move to a more suitable place. Thus, the enterprise has prepared some procedures to relocate to Tan Tao industrial zone in Binh Chanh District by 2004. At this new place, the enterprise will install an air emission treatment facility which meets Vietnamese environmental standards. The owner of VK enterprise said that relocation is an opportunity to develop its production and it may increase its profitability. Similar to TT's manager, he requested that the City Government should establish more convenient conditions for relocating SMEs, such as: giving loans with a satisfactory rate; provide tax reduction; ensure low land rents. He insists that infrastructure such as transportation, electricity, and water in new areas needs to be supplied completely. With such supports, relocation will gain very good results.

5.5 ADVANTAGES AND DISADVANTAGES OF THE RELOCATION PROGRAMME

So far, the programme is still an ongoing process. So, it is not possible to indicate all its advantages as well as its constraints completely. This research, based on collected data and information, tries to preliminarily identify prominent features of the advantages and shortcomings of the Relocation Programme in HCMC.

5.5.1 Advantages of the Relocation Programme

Based on analysed experiences, it should be recognized that while dealing with industrial pollution, relocation is also a tool of urban management and planning, as it seeks to ensure that land is utilised in the most economic and socially beneficial ways. In HCMC, the relocation of VISSAN Company forms an example of this. VISSAN, being a large stated-own industry, is the biggest slaughterhouse and food processing factory in HCMC. It occupied land of over 10 hectares near Thanh Da peninsula on the Sai Gon riverside, which is well-known as a tourist and amusement area in HCMC. VISSAN is one of the ten pilot enterprises that were forced to move out of the City by 2003. Another major advantage of relocation is clearly to prevent pollution exposure and harmful risks to local residents who live in densely populated areas[83]. Due to the fact that peripheral suburbs have smaller population densities in surrounding regions, relocation reduces the total health risk of exposure to pollutants. However, if proper inspection and supervision lacks, it will cause unexpected consequences which are described in detail after.

The relocation approach solves barriers for setting up a central effluent treatment plant, and reduces costs of collecting waste (see chapter 6). Moreover, the concentration of industries entails some advantages for the authorities as well. The monitoring and management of industries in one central location is far more convenient than that of thousands of small firms scattered over a large area and in various districts.

[83] According to Statistical Office (2003), the average population density in urban areas in HCMC was 10,388 pers/sq.km while that in rural areas in HCMC was 641 pers/sq.km.

Additionally, if managed properly, relocation can be a good chance for industries with obsolete facilities to update production lines and install new treatment capacities that discharge less pollution. Based on the result of surveys in District 11 and Tan Binh District (see Part 5.3), most SMEs agree that relocation will be an opportunity to enlarge their production scale (90%) and to increase their production area (86%).

The current relocation programme in HCMC not only aims to improve the pollution situation in residential areas, and renovate the technology and machinery of entrepreneurs. It also works cooperatively with residential relocation programmes and urban renovation, and aims to changing City production system towards clean technology, finding new markets, as well as raising the income and quality of life of people who live in suburbs.

5.5.2 Disadvantages of the Relocation Programme

Besides advantages in urban environmental management, industrial relocation also meets problems, disadvantages and threats, which might seriously jeopardize the success of relocation. This too is the case in the current relocation programme in HCMC.

5.5.2.1 Lack of institutional capacity and environmental management

In its relocation process, HCMC appears to replicate the process of Onsan Industrial Park and Ansan City which, as we learned, had negative side effects. Given that, lessons may be drawn from the experience of IZs' environmental management and from the control of industrial pollution of enterprises along to Thay Cai canal, as described in Box 5.3 and Box 5.4.

Box 5.3 Industrial zones as potential pollution sources

EPZs and IZs have been established in HCMC since 1991. Nowadays, there are 2 EPZs and 12 IZs with a total area of 4,000ha located in 8 districts within the City. By July 31, 2003 there have been approximately over 800 investment projects into these EPZs & IZs (foreign invested projects accounted for 46%) with a total investment capital over US$ 1.5 billion and VND 12,000 billion. After 10 years of operation, 3 IZs are 100% filled, 5 IZs 80% and 4 IZs are 50% filled (source: Hiep, 2003). According to environmental regulations, IZs and EPZs that have an occupancy rate of more than 50 percent are required to build a standard wastewater treatment plant.

Besides gaining economic benefit, the development of IZs also causes negative environmental effects. Its main pollution is wastewater, air emissions, and solid waste. According to Nguyen Trung Viet, Director of CENTEMA (Center of Environmental Technology and Management), most IZs which are planned and being operated, are hardly interested in environmental protection, and many of them have destroyed the environment of their surrounding areas (source: 'Dien dan Doanh Nghiep' magazine No.39/2003, p.9.).

While the City is pushing the implementation of the programme on polluting industries relocation to IZs, in reality the IZs themselves are an environmental pollution “hot spot”.

So far there are only 2 EPZs and 2 IZs which have invested and operated their own central wastewater treatment plant: Tan Thuan EPZ (with capacity of 10,000 m^3/day), Linh Trung EPZ (5,000 m^3/day), Le Minh Xuan IZ (2,000 m^3/day) and Tan Tao IZ (5,000 m^3/day). In the meantime, according to Mr. Nguyen Cuong, Vice Head of HEPZA (source: 'Dau tu' magazine, 4/8/2003, p.2.), around 30,900 m^3 of industrial wastewater is discharged at IZs daily, of which just 12,000 m^3 is treated wastewater (38.8 percent). Due to high costs and lack of finances, other IZs still delay to perform wastewater treatment projects (according to the developer of Linh Trung EPZ, up to US$ 1 million has been spent on a wastewater treatment facility for Linh Trung 1. Le Minh Xuan IZ's developer has invested VND 11.8 billion (US$ 780,000) to build a wastewater treatment plant (source: Saigon Times Daily 6/2/2003)). In addition, only a limited amount of industrial solid waste and toxic waste is being treated. The situation is now posing serious threats to the environment.

"The relocation could merely mean a shifting of pollution from urban areas to rural areas unless these businesses have solutions for waste treatment," said Doan Thi Toi, head of the Environmental Management section of DONRE (source: Vietnam News, 12/8/2003).

Due to a lack of management and monitoring, environmental management authorities cannot control the illegal discharges from industries in industrial zones (yet). As a result, the water quality of canals in the City, which receive discharged wastewater, continues to worsen (see Box. 5.4).

Box 5.4 Hoc Mon - North Binh Chanh hydraulic system

Hoc Mon- North Binh Chanh hydraulic system received an investment from a 1992 World Bank project loan to upgrade the system. The investment aimed to support agricultural production and residential living in the Western area of Hoc Mon district and Northern area of Binh Chanh district. The functions of the hydraulic system are irrigation, salinity prevention, alum reduction and land amendment of over 10,000 hectares of agricultural land in the area. However, recently, some residential areas and industrial zones were built in the project area and its vicinities.

A number of industries were established along Thay Cai - An Ha canal belonging to the catchment. They include alcohol, recycled paper and rubber processing factories which relocated from the inner city. Local people named them as *'enterprise 3 no- things'*: no name board, no entry allowance and no contact! (source: Tuoi Tre news paper 9/7/2003). Due to a lack of capital, the low awareness of businesses as well as weak enforcement and monitoring, industrial wastewater is not treated and discharged directly into the canals. Water pollution has changed An Ha - Thay Cai canal from a fresh water supply source to a malodorous, toxic body of water. In addition, bad smell and air emissions released from production units have caused lots of troubles to residents in the area.

►*Alcohol processing enterprises* - The alcohol processing industry is known as one of the industries causing seriously water pollution. Examples are enterprises as Le Gia, Hai Duy, Phu Binh, Tu Quang and Phan Muoi in Hoc Mon district (source: report No. /XDGT.MT dated 6/5/2003 of Hoc Mon's PC) and Hoa Thanh, Dai Hung Phat, Doan Thinh in Cu Chi district (source: report No. 28/BC-UB 2003 of Cu Chi's PC). Most of them had to remove from Tan Binh district. Only Le Gia enterprise is installing a wastewater treatment plant. Industrial wastewater that is discharged from these establishments has a black-brown colour, with a smell of fermented molasses. Average wastewater flow is about 100 m^3 per day for each establishment. Wastewater quality does not meet Vietnamese effluent standards TCVN 5945-1995. (See Table 5.9 below).

Table 5.9 Wastewater characteristics of alcohol processing industry (mg/litter)

Parameter	Concentration	TCVN 5945-1995
pH	3.9 - 4	5.5 - 9
COD	7520	100
BOD	3800	50
SS	265	100

(Source: Urban Management Division in Hoc Mon district 2002)

In addition, the attitude and opinions of industry owners strengthen the idea of pollution displacement rather than pollution control via relocation. They generally believe that[84]: (1) After relocation, factories do not need to pay attention to environmental protection. Environmental expenditures (for end-of-pipe treatment) are unproductive and unnecessary, and any measures taken will merely be motivated with respect to expanding production or to increase productivity of the existing technology; (2) relocation is only an opportunity to expand their production or/and to invest (land, premises) in the future.

5.5.2.2 Constraints in land use planning - Lack of land for relocation

There are only two IZs which planned to accept polluters from the inner city districts: Le Minh Xuan IZ and Hiep Phuoc IZ. However, so far, Le Minh Xuan has only 14 ha

[84] Based on face-to-face discussions

of land available (just for lightly polluting enterprises) and Hiep Phuoc IZ has 50 ha of land available and an additional amount of 30 ha of land being prepared. But in Hiep Phuoc IZ water supply was lacking by the end of 2003. This amount of area will be by far to less for the number of companies that need to be relocated from the inner city in 2004.

Finding enough land for relocation is becoming a problem. According to officials from the Executive Board of the Steering Committee, the City needs at least 720 ha of land for the relocation of 1,300 local polluting enterprises within three years, but only 68 ha of the 898 ha planned are available at present. This is due to the problems IZs are facing with site clearance and high compensation cost, according to Vo Thi Hiep, deputy head of HEPZA[85]. Quach To Dung, Deputy Director of DOI, admits that land clearance remains a big hurdle to the scheme "We're confused whenever a business manager comes to my office and asks for their factory's relocation site. Some have been given blueprints for their resettlement but they haven't moved to the new site because of the 'snail's pace' of land clearance there."[86]

According to a report from ENDA (2002)[87] and some district officials[88], many polluting small-scale industries are facing problems of where to go because they cannot find new production sites. Because existing IZs refuse the entry of smaller business since they are almost full and do not accept the low rental prices, which small-scale industries suggest. The failure of many industries to find new production sites is also caused by the high land rental prices in IZs, that are at US$ 40-70 per m^2 (during 40-45 years)[89]: out of reach for many small businesses.

Furthermore, the need of leased land areas for small-scale enterprises, such as rubber factories district 11 is quite small, about 100 - 500 m^2/enterprise (though quite different for medium-scale enterprises such as the dyeing factories of Tan Binh District). Meanwhile, all IZs require that each enterprise relocated to an IZ must rent at least 1,000 m^2 for their operation. They claim that the land lease price will increase if the minimum leased land area is divided into smaller areas, due to higher cost of infrastructure investment, such as electricity, water supply, drainage system and so on (Lam et al., 2003). Thus, all combined makes relocating very difficult for small-scale enterprises with their limited capital and poor financial conditions.

In particular, at present there is no outlet for the dyeing industry as well as other heavy wastewater-discharging industries. Of the whole city, only Hiep Phuoc IZ is able to receive similar industries, but it lacks sufficient water supply for production and there is a poorly developed transport infrastructure. "Many IZ management teams have refused to admit these polluting factories into their zone fearing they have to

[85] Source: Saigon Times Daily, 19/6/2003.

[86] Source: Vietnam News, 12/8/2003.

[87] ENDA (Environment and Development Action in the Third World) is an international non-profit organisation. It is one of the consultants to the Project VIE/96/023 'Enhancement environmental management capacity in HCMC'. Its 'Public Consultation Report' belongs to the report 'Financial Mechanism and Incentives for Supporting the Polluting Industries Relocation'. The report was based on the results of a survey of 42 SMEs in three districts (district 5, 11 and Tan Binh) in order to evaluate their environmental situation and their opinions on the Relocation Programme.

[88] Source: personal discussions.

[89] Source: http://www.hepza.gov.vn/en/IZ/Land-Price/

pour additional billions of VND to build a wastewater treatment system" Mrs. Quach To Dung confirmed[90].

This too makes it understandable why the surveys in Tan Binh and District 11 revealed that many SMEs agree to the instruction and assignment from authorities about their relocation sites (also see Part 5.3). Usually, it is less the SMEs who object to relocation, but the industrial zone management that has to locate them.

The establishment of a 'socio-economic industrial park' with a total surface area of 2,200 hectares of land in Cu Chi, Hoc Mon and Binh Chanh districts has been proposed. In response to this city's request, the Government has approved a 500 ha of land on the planned North-West IZ of the city to relocate polluting SMEs factories[91] to start. In addition, the Department of Planning and Architecture is planning seven other IZs with a total are of 450 ha for relocation and resettlement of polluting enterprises from the inner city[92]. However, all that has been completed so far seems drawn designs and written suggestions. Therefore the prior needs of the business and the objectives of the Relocation Programme will not be met in the near future. This forms a considerable constraint for the programme implementation.

5.5.2.3 Constraints from capital shortage and financial funding condition

Lack of capital forms the largest and most important problem for SMEs to relocate at present. Most of family-scale enterprises have a total capital between VND 60 and 300 millions (US$ 4,000-20,000). This is too small, compared to the need of billions of VND to relocate to a new place. This money will be essential to build a new factory, renewal of equipment and technologies, leasing land, and so on.

This problem enlarges due to the lack of financial funding from the government to support the relocation of SMEs. The vice chairman of Tan Binh PC, where SMEs in sectors such as dyeing, paper, chemicals and food processing are mainly concentrated, said that many polluting SMEs lack the money for both their relocation and the renovation of machinery[93]. The City authorities have introduced many financial mechanisms and incentives to support relocating enterprises (see Part 5.2), of which most are mainly directed towards the SOE sector. In reality, creating new capital from selling SOE's property and facilities as well as from transferring land use right seems to be impossible due to a very complicated procedure. It means that the sale of SOE's land and facilities has to be proceeded through the Land Pricing Board. The justification for this is to allow the Board to fix a 'floor price' for the land. Returns from transferring land use rights (the value of the land) are to be kept in temporary account at the State Treasury until investment at a new location has been approved by the relevant authorities. According to Taylor (2002), "it is unclear what procedures will apply in order for the enterprise to 'ask for permission' to utilise what, in essence, are its own resources". Such unclear procedures could and will delay the relocation process significantly.

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[90] Source: Vietnam News, 4/10/2002.

[91] Source: Vietnam News, 4/10/2002.

[92] Source: Lao Dong News Paper, 19/6/2003.

[93] Source: Saigon Times Daily Newspaper, April 08, 2002.

According to HIFU, the main obstacles for SMEs to receive loans from formal sources are their unclear accounting papers, which make it difficult to properly appraise the business and the general insufficient provision of collateral security. Meanwhile, as one representative SME owner, Mr. Ly Siu Lan, of the glass producing enterprise Lan Ly in District 11, stated "The relocation is all-right but our largest difficulty is capital. The government has a support policy, but the loaning procedure is very complicated and complex. We have to submit a production project and many documents which prove repayment capacity, etc. But because the existing facilities are hired, we can not afford the construction of a new area"[94].

In fact, the survey in Tan Binh District and District 11 (see previous section) revealed that 17 out of 21 SMEs need loans but only 11 of them really prepare documents to obtain a loan, because of the current complicated loaning procedure. Eight out of the 21 SMEs think the loaning procedure is very complicated. At present in HCMC, only nine enterprises have been issued the "Certification of Favourable Relocation Investment" with a total amount of the loan up to VND 36 billions (US$ 2.3 millions). However, up till now, no enterprise could receive the supporting money for compensating loan interest as promised[95]. If we compare this with the financial needs among the numbers of SMEs in the Relocation Programme, we clearly see the bottlenecks.

In speeding up the Relocation Programme, capital shortage is and will remain a big challenge for HCMC's government. Many financial solutions have been suggested to solve this problem (e.g. a simple structure with large loans), but it seems that they still have not satisfied the practical demand and situation of SMEs.

5.5.2.4 Economic risks

In part 5.4, some characteristics of SMEs in HCMC have been revealed, such as the particularly small production area, low and simple management level, combination of living area and working place, location in crowded residential areas of HCMC, and low environmental awareness. While relocation might solve some of these problems, other challenges can emerge after relocation.

Losing skilled workers and laborers is one of the central concerns of especially large industries in relocation. Moving to a new place far from the original living areas of the employees will cause many problems, especially related to the cost of transportation. While most employees of SMEs are manual laborers, often relatives of the enterprise owner and living near or at their working places, the danger of losing such workers is not really a problem to SMEs (see Table 5.7). Over 60% of the interviewed SMEs believed they could hire new labor at the new places and that the hired salary of these employees will often even be lower (Lam et al., 2003).

One of the strong points or advantages of SMEs is their flexibility in production. They are often very close to the market and active in adjusting their production to the needs of the market and requirements of the customers. Besides, the price of their products is quite competitive, because of diversity in sources from suppliers. These traditional

[94] Source: Saigon Giai Phong (SGGP) News Paper dated 7/2/2003. This article which was performed by Han Ni was based on his interviews to six owners who represent for small-scale enterprises in District 11 on their opinions on the Relocation Programme.

[95] Source: Report of the Relocation Programme's Steering Committee dated June 17, 2003.

consumers and supplier relations could be jeopardized when SMEs move to a new place. In addition, the cost of production will increase due to an increase in distance, which will impact the economics of their business. Furthermore, support services for business activities (such as machine repair and maintenance) are more readily available and convenient within the city. Raw material supply as well as product transport to the market are likely to be more costly and complicated. This is especially relevant for family-based firms due to traditional and close relations with customers or other firms at their current locations (also claimed by Mrs. Nguyen Thi Ngoc Lan, owner of Ngoc Lan dyeing enterprise in District 11)[96]. These problems can be managed in different ways, such as using the old location as an office or storage and the new place for production. But these solutions will still increase costs of production.

In summary, the relocation policy places small-scale enterprises in a dilemma 'difficult to move, unable to stay'!

5.6 CONCLUSIONS

In improving urban environmental quality, relocating polluting industries to suburban districts or city's outside areas seems to be an approach which many cities prefer (cf. Bai, 2002; Kwon and Lee, 2003; Morikiho, 2003). Besides preventing pollution exposure and reducing high-risk situations for local residents, there are also great potential economic benefits attached to the urban development and land-use planning. In addition, if managed properly, the relocation can be a good chance for industries with obsolete facilities to update production lines and install treatment facilities so that less pollution is discharged. Furthermore, and more specific for the relocation programme, relocation aims to revitalize suburban economies, as the relocation of industry – and with that employment – will increase the income of people living in HCMC suburbs. On the other side, the research pointed out that if the environmental monitoring and management in the designated industrial areas is lacking, relocation will merely result in increased pollution at a difference place.

The development and implementation of the Relocation Programme in HCMC are at present still ongoing and any final conclusions on the success or failure of the programme would therefore be premature. However, based on the evidence of its performance up till now, attempting to complete the Relocation Programme by the end of 2004 would be highly ambitious. In other words, the result of the Relocation Programme is far less than expected and planned.

This study remarks that many efforts from City authorities aim at making the Relocation Programme a success. However, the case-study analyses show that due to inconsistent and sloppy implementation; inadequate preparation in terms of land planning, infrastructure on relocation sites; unclear financial funding conditions and complicated disbursement procedures; etc. so far the Relocation Programme itself is not very attractive to SMEs for relocation. Put in other way: so far conditions for SMEs in new sites are not preferable to those in current one.

[96] Source: SGGP News Paper, dated 07/2/2003.

In the Relocation Programme implementation, the role of the HCMC People's Committee is very crucial. The differences of scale and mobilised resources between the separated relocation programmes of some districts and the current Relocation Programme proved that without HCMC-PC's commitment the relocation will not be successful for sure. The City leaderships have put pressure on City departments by requiring them to use much of their resources in establishing and developing the Relocation Programme. However, on one hand the hastiness of City leaders in the process implementation causes some confusion to executing institutions and even to industries. On the other hand, by largely using a top-down, state-dominated regulatory approach, the HCMC-PC's policy sometimes exposes inflexibility, for instance by commanding polluting industries to relocate by 2004 while infrastructure preparation for their relocation proceeds very slow, and by designing a financial support structure that is rigid and bureaucratic. In addition, the studies found the relationship between City authority and industry, especially SMEs, in the relocation implementation process very loose, and mostly one-sided, except in the case of Tan Binh People's Committee. The absence of constructive interactions between authorities and industries that allow feedback on policies, instruments and support systems in the Relocation Program is a serious predicament to the project implementation.

However, at the same time signs of a transforming policy-style can be witnessed in the implementation of the Relocation Programme, such as the decentralization of environmental management in industrial zones, the community-based approach in Tan Binh district, and the emergence of new roles for sector associations. These are examples of innovative, flexible strategies of negotiation and consultation that complement the otherwise command-and-control approach of the Relocation Programme and give new shape to the relationship between the government and the private sector. Such policy-innovations might herald a comprehensive multi-dimensional process of political modernization, implying new relationships between state-industry and state-non governmental actors with more decentralized, flexible and consensus-oriented arrangements (Mol, 1997a). Yet, at the moment less ad hoc and institutionalized channels for public participation in decision-making processes are still lacking in the Relocation Programme, as they are in HCMC's environmental management in general. And recounting on universal changes in the government's policy-style would thus be premature.

Although the experience of industrial relocation is different from city to city due to divergent socio-economic conditions, the lessons drawn from failures in Onsan Industrial Park and Ansan City (South Korea) as well as from successes in Dailian (China) suggest that in order to avoid a burden of socio-economic and environmental costs, a relocation programme must be considered and developed in an integrated manner, including the following significant factors: building institutional capacity (such as strengthening the role of local authorities, policy making capacity, resources) and enhancing management capacity, jurisdiction over integrated planning (integration of upgrading urban function, environmental improvement and market-oriented city management as Dalian's experience), coherent implementation, consistent enforcement and monitoring, and harmonized coordination (between authority-enterprise, central government, local government, state-society) (cf. Bai, 2002; Taylor, 2002; Kwon and Lee, 2003; Morikiho, 2003). Improving the HCMC Relocation Programme along these lines would bring it much closer to ideas of political modernisation.

6. ASSESSING END-OF-PIPE TREATMENT APPROACH

6.1 INTRODUCTION

In general, the end-of-pipe (EoP) treatment approach, which is considered as a basic part of conventional environmental regulation (command-and-control), plays an important role in controlling industrial pollution. Many scholars (Bartone and Benavides, 1993; Hobbs, 2000; Holm, 2000; Scott, 2000; Zhang and Chen, 2001; Dasgupta, 2000; Dieu, 2003; Frijns, 2003; Han Shi, 2003; Khan, 2003) have analyzed the advantages and weaknesses of EoP measures. The advantages are the relatively easy addition to the production process, and it treats waste properly to achieve legislative compliance. However these advantages are counterbalanced by disadvantages such as relatively high costs, the creation of new environmental problems or undesirable side-effects, discouragement of continuous improvements in environmental performance, and failure to stimulate technology innovation.

In brief, the construction of a centralized wastewater treatment plant works very well at reducing the contamination of soils, surface water and ground water with liquid waste. However, the following hurdles have to be taken. First, an appropriate site for building the plant must be found. SMEs are often located in the inner city, surrounded by residential premises, so land is in general unavailable. Even if land can be found, acquiring it is very difficult as was experienced in the cases of Wazirpur Industrial Estate and Anand Parbat (Dasgupta, 2000). Or else, the site is too far from the SMEs so that transport costs become excessive. Secondly, there is the technical problem of mixed organic and inorganic wastes, which causes inefficiency and increase of operating costs. Thirdly, as SMEs hardly ever have an EoP treatment system for each facility, there is the more complicated problem of sharing the investment and operating costs among enterprises. On which criteria should SMEs be charged: quantity or quality of their wastes? According to Dasgupta (2000), fixing rental values based on load type and quantity will encourage industry to upgrade technology to reduce pollution at source and would be an equitable system. A final problem relates to how the plant should be managed. Many issues play a role such as expertise, technology, organizational structure, the lifetime of the plant and even the existence of industries in the future. An alternative to a centralized EoP can be a decentralized EoP.

In HCMC, EoP treatment seems to be an often used and familiar method to handle wastes and emissions from industries. To contribute to the understanding of the strength, weakness and possibility of the EoP treatment application in SMEs under HCMC's conditions, this chapter presents the evaluation of the centralized wastewater treatment approach, through the investigation of the central wastewater treatment plant in Le Minh Xuan industrial park and of two SME's clusters (dyeing enterprises in district 11 and tapioca processing ones in Thu Duc). Section 6.2 answers the question related to this evaluation: what are possibilities of applying centralized wastewater treatment to SMEs in HCMC, especially in densely populated areas? The second evaluation introduced in this chapter goes into the application of dispersed or decentralized waste treatment approaches through investigations of SMEs such as chemistry, dyeing, mechanics, glass, plastics, rubber, food production, beverage, and

paper (in district 11, Tan Binh and Thu Duc district). Lastly, conclusions on the EoP treatment application in SMEs are drawn in the light of the evaluation criteria and political modernisation theory.

6.2 CENTRALIZED END-OF-PIPE TREATMENT APPROACH

6.2.1 Description of Case Studies

6.2.1.1 Centralized wastewater treatment plant in Le Minh Xuan industrial park

The general information of Le Minh Xuan (LMX) industrial park is introduced in Box 6.1.

Box 6.1 Le Minh Xuan industrial park

LMX industrial park was established under Decision 630/TTg on August 8, 1997 by the Prime Minister. It is a project of Binh Chanh Construction Investment Shareholding Company (BCCI) under the management of HCM City Industrial Park and Export Processing Zone Authority (HEPZA).

LMX industrial park situates in Tan Nhut and Le Minh Xuan communes of Binh Chanh District, HCMC. Its total area is 100 ha, including 66.23ha for premises. The park receives projects in the light industry, mechanical engineering, production of electronics, processing cereals and foods, production of handicrafts, even polluting fields in air, waste water, noise, etc. Until June 2002, the industrial park received 121 investment projects.

Utilities includes power supply from the national power grid via the Phu Lam transformer station; water supply from the municipal water supply system and the internal underground water system; the industrial park has a waste water treatment station with a present capacity of 2,000 m^3/day and a drainage system; other services such as customs, banking, etc.

LMX industrial park is the first industrial park of the country to build a quality management system of international standards. It has been awarded the ISO 9002:1994 certified by the Swiss certifying agency SGS. Land rent is US$ 50/sq. meter for 46 years. Waste water treatment fee is VND 2,700/m^3 (the volume of waste water treated is 90% of the water for production). Water price: VND 3,200/m^3.
Source: http://www.accessvietnam.net/investmentvietnam/investment_hochiminh_1.html

The centralized wastewater treatment plant in the LMX industrial park was constructed in 1998, completed in 2001 on an area of 4,000m^2, and has cost VND 11,847 millions (US$ 780,000). The plant officially started operating in September 2002 with a capacity of 2,000m^3. This wastewater treatment plant complies with the industrial wastewater discharge standard TCVN 5945-1995-Class B as audited by the DOSTE of HCM City. During the period of construction, wastewater from the industrial zone was temporarily discharged to the rainwater system and directly released to canal 8 without any treatment, while there was very little pre-treatment at the enterprises. During that time, there have been a great number of complaints from surrounding communities with regard to industrial wastewater. At the end of 2002, the management board of LMX industrial park inspected and enforced the environmental performance of the enterprises and connected the wastewater pipelines, leading pre-treated wastewater from manufacturers (meeting TCVN-5945-1995-Class C) to the centralized treatment plant to achieve the standard of TCVN-5945 -1995-Class B.

The wastewater treatment technology of the centralized plant in LMX industrial park is presented in Figure 6.1.

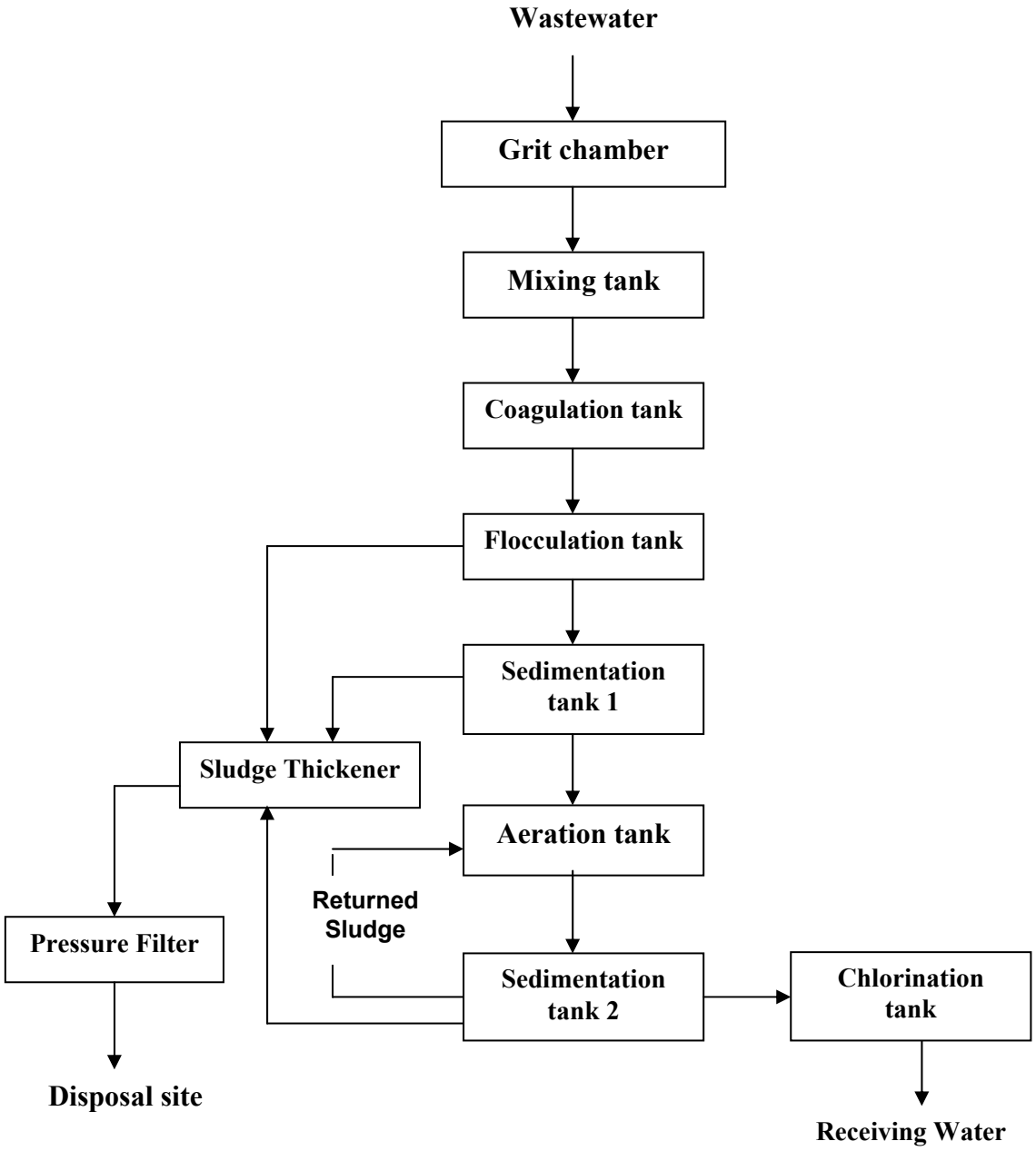

Figure 6.1 Flow sheet of the centralized wastewater treatment (WWT) plant in Le Minh Xuan industrial park

6.2.1.2 Centralized EoP treatment of two SME clusters

Textile-Dyeing SMEs cluster in District 11 and Tan Binh

As described in chapter 5, District 11 and Tan Binh can be seen as areas with typical pollution problems in household-scale industries and medium and large-sized manufactures within HCMC. Textile-dyeing industry is strong in District 11 and Tan

Binh. Moreover, in these days this industry has rapidly developed its quantity and variety of products. Textile-dyeing industry traditionally belongs to the private sector. For example, the Phu Binh textile and dyeing village is the biggest industrial village, existing for many years. Although it is called a manufacturing village, the distribution of these enterprises is not even. The textile-dyeing factories are located in residential areas. There are, however, other types of manufacturing factories such as rubber, plastic, glue, paper, etc. The spreading of the dyeing factories hampers transporting the industrial wastewater to a centralized treatment plant.
Wastewater discharges from dyeing activities are heavily affecting the environment. The wastewater discharged by these enterprises is highly polluted, hundreds of times exceeding the effluent standards: the COD and BOD_5 parameters can reach values of 1,200 and 650 mg/l respectively, and pH parameter can reach 12.
As representatives of this typical industry with a strong potential pollution, four dyeing SMEs in District 11 were chosen for this survey. These are SMEs characterized by a small number of employees, an investment capital of less than US$ 300,000, the use of obsolete machines and semi-automatic technologies. They have been operating for many years. Most of these enterprises use groundwater for their manufacturing process. The main energy source is fuel oil (FO) or coal which can cause considerable air pollution. These enterprises are also subjects for relocation to an industrial area. Some information of the dyeing manufacturers surveyed in district 11 is presented in Table 6.1.

Table 6.1 Information of dyeing enterprises surveyed in district 11

No.	Name	Type	Operation duration (year)	Status	Comments
1	NGUYEN THANH DOAN	Dyeing	7	Relocating, but wishing to apply CP	No wastewater treatment facility Existing emission treatment facility
2	NAM THANH	Dyeing	8	Will be relocated	Primary wastewater treatment facility No air emission treatment facility
3	DUC PHU	Dyeing	10	Will be relocated	No wastewater treatment facility Primary air emission treatment facility
4	NHUOM PHAT	Dyeing	10	Will be relocated	No wastewater and air emission treatment systems

Tapioca processing SME cluster in Tam Binh, Binh Chieu ward -Thu Duc district

Thu Duc district was a suburban area, and has recently been re-classified as urban area. Although the residential density in this area is not as high compared to other urban areas, such as District 11 and Tan Binh[97], there are many enterprises with a variety of production processes. The density of these manufacturing villages is

[97] Population density (yr 2002) (inhab/km²) of Thu Duc was 4,899 while that of Tan Binh and District 11 was 18,656 and 49,243 respectively (source: Statistical Office. 2002). In 2004 Tan Binh district has been divided into the districts Tan Binh and Tan Phu.

relatively low due to the large area of the district. Tapioca production industry was selected in this survey because of its potential pollution in this area and because of all present industries it has the highest number of enterprises.
Most tapioca enterprises are located in Tam Binh and Binh Chieu Ward and can be divided into 2 groups: Group 1 in commune No.3, Binh Chieu Ward, includes five enterprises located mostly along the main street to Binh Chieu industrial zone. Some typical enterprises are those belonging to owners Mr. Huy, Ngoc, and Khuu (see Table 6.2). Group 2 located in commune No.1, Tam Binh Ward (opposite to Dai Han highway) includes eight enterprises. Characteristics of this group are similar to those of Group 1.
Generally, the main source of pollution in this area is wastewater discharge from manufacturing processes.[98] According to a field survey, some characteristics of these enterprises can be listed as follows: Production techniques tend to be traditional and manual, machines and facilities are often self-made, production is not stable due to strong market competition, operation is intermittent due to the seasonality of the harvest; financial solvability is limited due to the household scale; and with household scale, employees are mostly manual laborers and are hardly trained.

Table 6.2 Information of tapioca production enterprises surveyed in Binh Chieu, Thu Duc District

No.	Parameter	Hao Hiep enterprise	Minh Quoc enterprise	Hoa Sen enterprise
1	Representative owner	Mr. Huynh	Mr. Ngoc	Mr. Khuu
2	Capacity (tons of tapioca/year)	2,000	1,200	1,200
3	Raw material (tons/day)	6 – 8	3.5 – 4.5	3 - 5
4	Production (tons/day) *(46% humidity)*	2 – 3	1.2 – 2	1 – 2
5	Water input (m^3/day)	60 - 80	45 - 60	30 - 50
6	Electricity (Kwh/day)	40	-	-
7	(Permanent) employees	5	5	5
8	Working hours/per day	12	12	12

Notes: ' - ' information was not available and/or interviewees did not answer.

Wastewater treatment facility is installed in most of these enterprises (two enterprises in Tam Binh share one wastewater treatment facility). Their treatment technology is generally as follows:

Wastewater → *Bar rack* → *Equalization tank* → *Sedimentation tank* → *Anaerobic treatment tank* → *Receiving Water*

Treated wastewater must meet the requirements of standard TCVN-5945-1995-Class B. However, due to lack of supervision from authorities, lack of skilled employees as

[98] Wastewater discharged by tapioca processing activities is highly polluted, exceeding the effluent requirements: The COD can reach 40,000- mg/l, the BOD_5 can reach 14,000 mg/l, the pH is normally lower than 5 and the CN^- can reach 30 mg/l. Pollution effects of tapioca factories to surrounding area were recorded (Khoa and Boot, 1998; Dieu, 2005).

well as high costs of operation, these treatment systems are not in use. They are only operated when authorities come to inspect (see more information and evaluation in part 6.3.1.2.b).

6.2.2 Evaluating the Centralized End-of-pipe Treatment Approach

6.2.2.1 The case of centralized wastewater treatment in LMX industrial park

Effect and Effectiveness Evaluation

Results of analyzing wastewater of the central wastewater treatment plant of LMX industrial park is presented in Table 6.3.

Table 6.3 Wastewater quality (before and after treatment) of Le Minh Xuan wastewater treatment plant

Parameter	Unit	Quarter I		Quarter II		Quarter III		TCVN 5945-1955 – Class B
		Before	After	Before	After	Before	After	
pH		6.3	7.08	7.73	7.21	6.04	6.86	5.5 – 9
COD	mg/l	1,188	130	2,016	96	1,200	98	100
BOD5	mg/l	518	44	-	48	400	42	50
SS	mg/l	111	15	112	37	152	14	100
Phosphorus	mg/l	4.62	0.72	4.51	1.92	6.93	2.19	6.0
Nitrogen	mg/l	35.75	3.91	31.27	15.67	34.5	16.4	60
N-NH3	mg/l	11.9	1.03	2.37	0.95	7.3	0.85	1.0
Oil, grease	mg/l	21	0.2	13.2	0.2	78.6	2.7	10
Fe	mg/l	1.31	0.43	11.06	1.15	11.7	2.4	5.0
Nickel	mg/l	0.85	0.43	0.37	0.23	0.52	0.4	1.0
Zinc(Zn)	mg/l	1.12	0.98	0.91	0.35	8.8	3.24	2.0
Copper(Cu)	mg/l	17	0.17	0.12	0.031	<0.05	<0.05	1.0
Manganese	mg/l	2.11	0.52	2.17	0.32	1.13	0.43	1.0
Phenol	mg/l	ND	ND	ND	ND	0.89	<0.001	0.05
Cyanide(CN-)	mg/l	ND	ND	ND	ND	0.67	0.05	0.1
Tin (Sn)	mg/l	ND	ND	ND	ND	ND	ND	1.0
Arsenic (As)	mg/l	0.0045	0.0045	0.005	0.005	<0.001	<0.001	0.1
Cadmium (Cd)	mg/l	ND	ND	0.018	ND	<0.025	<0.025	0.02

(Source: HEPZA, 2003)

The results in Table 6.3 show that the COD, BOD_5 and SS concentrations of the influent fluctuated in the range of 1,200-2,100, 400-520 and 110 - 150 mg/l respectively; those of the effluent fluctuated in the range of 96-130, 42-48 and 14-37 mg/l respectively. The treatment efficiencies achieved for each of these parameters was higher than 90% (except for the cases of SS in quarter I and II) and the effluent complied in most cases with effluent standard TCVN 5945-1995-class B (except the cases of COD and $N\text{-}NH_3$ in quarter I, see Table 6.3).

Has the establishment of the centralized wastewater treatment plant taken away the danger to the aquatic environment around LMX industrial park? Some information about the answer is presented in Box 6.2 (additional information in Box 5.3 and Box 5.4 in chapter 5).[99]

Box 6.2 Aquatic environmental situation around Le Minh Xuan industrial park

"The environmental situation in LMX and Tan Binh industrial parks in HCMC is very serious" Mr. Hiroshi Omri, Head of consultants of Japan Overseas Development Cooperation (JODC) stated in the technical assistance workshop on "Wastewater treatment in HCMC's Industrial zones" in March 2003. This comment was based on JODC's surveys in LMX and Tan Binh industrial parks on request of HEPZA. He also said that at LMX industrial park, despite the existence of the centralized wastewater treatment, the location of sewerage and wastewater pipes from enterprises have not yet been identified clearly (source: Tuổi Trẻ News paper, dated 7/3/2003, page 11). Besides, in one of the surveys to identify the reason of pollution in Thay Cai – An Ha canals, Mr. Nguyen Van Dam, Deputy Director of the Hydraulic Services Exploitation and Management Company, considered that the pollution of Thay Cai – An Ha canal system is caused by Tan Phu Trung industrial park, LMX industrial park and some small-sized enterprises in Hoc Mon district. He wondered why LMX industrial park still discharges black and malodorous wastewater into canals C16, C14, A and B despite the operation of a wastewater treatment plant. (Source: http://www.vnn.vn/xahoi/diembao/2004/02/52092/).

In addition, Mr. Ngo Hoang Minh, Deputy Head of HEPZA, declared that so far there are over 700 enterprises in HCMC's industrial parks releasing 25,000 m^3 of wastewater per day in which only 13,000 m^3 is being treated (52% total of discharged water). *(http://www.vneconomy.com.vn/vie/index.php?param=articleandcatid=08andid=050613100357).*

Canal water quality affected by wastewater from LMX industrial park is presented in Table 6.4 below. The outcomes show that none of the parameters meets standard TCVN 5942-1995-B (Water quality standard for receiving waters such as rivers, canals not being a water supply source), except the pH and SS concentration at low tide.

Table 6.4 Water quality in Canal C12 receiving wastewater from LMX industrial park

No.	Tide	pH	SS	BOD_5	COD	Total P	Total N
1	Low	6.8	48.5	**37.5**	**97**	**0.11**	**9.35**
2	High	6.8	**103**	**35.5**	**78**	**0.3**	**7.95**
Vietnamese standard, TCVN-5942-1995-B (*)		5.5-9	80	25	35	NA	1

(Source: HEPA, April, 2005)

It is clear that the connection of the wastewater pipelines from each enterprise to the common sewer of the industrial park must be considered carefully. Mr. Tran Ngoc Suoi, Vice- Chairman of People's Committee of Binh Chanh district, reported that although the centralized wastewater treatment of LMX industrial park meets the environmental regulations and effluent standards, oil and coloured wastewater are still discharged from the drainage outlet. He stated that the control of wastewater discharge from enterprises into the common sewer is inadequate.[100] Mr. Huynh Vinh Hue, Deputy Director of the BCCI, confirmed that conclusion, but he could not

[99] Phung and Mol (2004) recognize that LMX industrial park has caused negative impacts on human health and environmental quality.

[100] Source: http://vnexpress.net/Vietnam/Xa-hoi/2005/05/3B9DE4F4/

indicate how many enterprises had "mis-connections" due to the subterraneous location of the pipelines.[101] The inadequate connections not only occur at LMX but also in other industrial parks in HCMC, such as Binh Chieu, Tan Binh, Cat Lai 2, and Tay Bac-Cu Chi. DONRE and HEPZA have inspected and detected that many enterprises did not connect their discharge pipeline to a common sewer (the cause of disconnection is explained in the following section). HEPZA asked companies operating in LMX industrial park many times to follow environmental regulations and even disclosed the name of some polluting companies such as Strongway Vietnam, Jin Kyong Vina, and A.T.A. In a survey in the middle of 2004, discovered that of 18 inspected enterprises, 17 had illegally connected their discharge pipelines to the drain system. This situation seems to worsen, therefore HEPZA intends to organize a special section to put pressure on enterprises in Binh Chanh, Tan Tao and LMX industrial parks to connect to the central wastewater treatment plants.[102]

HEPZA has actively worked on solutions for dealing with environmental problems in IPs and EPZs. HEPZA has been seeking aid from the Japanese government to fully equip all the IPs and EPZs with wastewater treatment facilities. In cooperation with CTC, a technology transfer, training and consulting centre under the Steering Committee for Clean Water Supply and Environmental Hygiene, HEPZA has requested the approval from MONRE to establish a centre to train 1,500-2,000 employees in pollution control in their enterprises and build a laboratory for environmental analysis and monitoring at IPs and EPZs.[103] Recently, under HEPZA's arrangement, the representatives of three industrial parks including LMX, Tay Bac-Cu Chi, Tan Thoi Hiep and the Centre of Industry and Information Services have signed a memorandum with Glowtec, a Singaporean company, on the establishment of a joint-venture company for environmental pollution treatment in HCMC's industrial parks.

Insufficient collaboration of DONRE, HEPZA and the infrastructure investment company of industrial parks (such as BCCI), lack of inspection, enforcement (such as penalties for non-compliance) and monitoring by authorities, and low environmental awareness of enterprises have caused failures in environmental protection in industrial parks. Consequently the environmental effectiveness (or positive impact) of centralized wastewater treatment systems turned out disappointing.

Cost-effectiveness evaluation

Wastewater treatment in industrial areas is often centralized for the whole zone. In order to look after the abatement effectiveness of such a system, quantitative and qualitative fluctuations of the influent must be stabilized. However, the wastewater quality differs from factory to factory and strong peak loads occur. Therefore, these centralized wastewater treatment systems highly risk inefficient operation, and even complete system failures. According to Mr. Pham Minh Duc, General Director of BCCI which hosts LMX industrial park, the influent COD concentration of the treatment plant usually reaches 1,500-1,800, and even 4,000-5,000 mg/l, while the designed influent concentration is only 600 mg/l. These exceeding loads have caused

[101] Source: http://www.tuoitre.com.vn/Tianyon/Index.aspx?ArticleID=46341andChannelID=3

[102] *Source: http://vnexpress.net/Vietnam/Xa-hoi/2005/05/3B9DE4F4/*

[103] Source: http://www.vneconomy.com.vn/eng/index.php?param=articleandcatid=17andid=030207090713

several difficulties in the treatment process and increased treatment costs. Therefore, in factories with high concentration of specific pollutants, compulsory pre-treatment to reach an explicit standard is fundamental to run a central plant successfully.

LMX industrial zone has been established to rehabilitate polluting factories. Factories relocated from inner HCMC and new investors with a high risk of pollution have been brought together in this industrial zone[104]. Once located in industrial zones the enterprises feel free from the complaints of residents and less supervised by authorities. Consequently, they now concentrate on manufacturing, but ignore measures to protect the environment. In many circumstances, the IZ invested company and enterprises easily make a shadow agreement: that is to 'close their eyes'. According to pollution control regulations, enterprises must pre-treat their wastewater[105] before discharging it into the industrial park's common treatment system. Thus, it would discourage enterprises to invest in the industrial park. Especially in industrial parks with many SMEs with limited capital, the establishment of all these small pre-treatment units is not recommendable[106] from an economic point of view. Another burden for enterprises is that the wastewater treatment fee is nearly as high as the price of supplied water (in LMX industrial park, the fees of wastewater and water supply are VND 2,700/m^3 (US$ 0.18/m^3) and VND 3,200/m^3 (US$ 0.21/m^3) respectively). The quantity of water consumed, measured by water-meters, is usually the basis for charging both. In LMX industrial park, the quantity of wastewater discharged is based on 90% of the water consumed (in case a meter for measuring wastewater flow is lacking). The level of charge is not based on effluent quality. To save money, some enterprises discharge their wastewater directly into open drains or canals instead of the common sewerage system of the industrial park[107]. It is a paradox because the industrial park owner had to pay VND 11,800 million (US$ 780,000) for the construction of a centralized wastewater treatment plant (phase 1 with capacity 2,000 m^3/day) and VND 120 million (US$ 8,000) per month for operation and maintenance (O&M). In order to charge wastewater-discharging enterprises, the management of the industrial park has to supervise strictly and signs a service contract with the wastewater-discharging enterprises. But, many enterprises have not yet signed a contract for wastewater treatment. According to the management of LMX industrial park, at the moment, only 62 out of 115 operating enterprises have signed a wastewater-treatment contract, but unfortunately these enterprises have a debt of one billion VND (counting from April 2002 to June 2004)[108]. Consequently, it poses a big financial hurdle, especially in the O&M of wastewater treatment plant, to BCCI.

Although LMX still has a favourable situation with a functioning centralized WWT plant, high costs and competition to attract investors[109] have been blamed for the

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[104] Some favorable financial supports which relocators receive have been described in Part 5.3.2.

[105] In LMX industrial park, pre-treated wastewater has to meet the effluent standards TCVN-5945-1995-class C

[106] Construction cost for a wastewater treatment plant, see Table 6.17

[107] "Many producers at IPs and EPZs lack their own wastewater treatment facilities," Mr. Tran Thien Tu, former deputy head of HEPZA, says. "Some that have such facilities just operate them when there are inspections."

(source: http://www.vneconomy.com.vn/eng/index.php?param=articleandcatid=17andid=030207090713)

[108] Source: http://www.tuoitre.com.vn/Tianyon/Index.aspx?ArticleID=46341andChannelID=3

[109] Le and Nguyen (2002) also stated that the investment policy is biased towards attracting enterprises to register into industrial estates. Industrial estate authorities understand that it is hard to impose a very high rental rate in order to cover the treatment fees in the beginning stages. Therefore, they delay the construction of common wastewater treatment plants for as long as they can.

delays in wastewater treatment projects in many of the industrial parks in HCMC.[110] Several industrial park developers admit they have yet to start their work on wastewater treatment plants due to the lack of finance, as such facilities require big spending[111]. This is called "the longer, the better" attitude. Under such circumstances, it can be understood that HEPZA highly appreciates the treatment initiative at LMX industrial park and enforcement is not too strict, seeing the priorities of other industrial parks. In order to assist the management of LMX in environmental protection, in May 2005, People's Committee through the City Investment Incentive Fund granted a loan of VND 13.7 billion (US$ 870,000) without an interest rate to the LMX industrial park for phase 2 of the construction of the wastewater treatment plant extending the capacity to 4,000 m^3/day. Mr. Pham Minh Duc recognized that the extended plant, besides overcoming the overload situation of the former one, will contribute to wastewater treatment of the industrial cluster (17 ha) of Binh Chanh district nearby.[112]

As a matter of fact, a wastewater treatment plant can be considered a non-profit unit. The investment in a wastewater treatment plant (by both the industrial park owner and each enterprise) is not meant to make (high) profits; it only adds costs and expenditures, and increases product prices.

6.2.2.2 Opportunity of centralized EoP treatment for SMEs in HCMC

Through the survey of two mentioned SME clusters and LMX industrial zone as well as interviews with relevant officials and researchers (see the list of interviewees in Appendix 5), it can be concluded that the centralized EoP wastewater treatment approach can only be applied in industrial zones or with groups of enterprises, where all factories are located close to each other. This has been demonstrated by their operation in industrial zones in HCMC. It is difficult and quite impracticable to develop a centralized wastewater treatment for factories located dispersedly in urban residential areas due to the following reasons.

Firstly, one faces difficulties in improving existing combined sewers to separated sewerage system[113]. Normally, urban sewers have been established years ago, and their reconstruction (to become separated systems) is very costly; especially the cost of relocation and of establishing a new collection system for factories (separated from the residential system). In addition, according to Van Buuren (2005), there are many technical constraints in developing a new sewer system at ward level, such as lack of space for sewer lines, lack of detailed maps and clear plans for the area; insufficient heightening of the land prior to building; lack of surveillance of projects, etc. Thus, in densely populated areas such as Ward 15-District 11 or Ward 19- Tan Binh District, the reconstruction of the existing sewers seems to be practically impossible under the current situation.

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[110] According to Le and Nguyen (2002), a common WWT plant with a capacity of 1,000 m^3 per day may cost anything from US$ 1.2 million (Loteco, Dong Nai), or US$ 1.6 million (Viet-Sing, Binh Duong), to USD 3.4 million (Bien Hoa 2, Dong Nai). This expenditure alone comprises some 25-30 percent of the total investment capital of an infrastructure construction company.

[111] Source: http://www.vneconomy.com.vn/eng/index.php?param=articleandcatid=17andid=030207090713

[112]Source: http://www.vneconomy.com.vn/vie/index.php?param=articleandcatid=08andid=050613100357

[113] Most of the existing sewers at HCMC now are combined systems receiving both domestic and industrial wastewater discharges.

Secondly, there are difficulties due to lack of land to construct a centralized treatment plant. In areas of high population n density, especially in HCMC, setting aside land for this activity is very difficult (e.g. cases in Tan Binh and District 11).

Thirdly, environmental issues derive from such a treatment plant. When it is located in residential areas, odour problems, especially in dry seasons, are of concern to the surrounding communities.

Fourthly, lack of financial resources of SMEs always form constraints for their willingness to financially participate in such public projects.

Fifthly, there are egoistic considerations, especially in relation to household-scaled enterprises. Due to high market competition, conflicts have arisen, related to know-how of production technology, lack of cooperation between enterprises, and lack of a "real public leader" for these enterprises. Future disputes in establishing a centralized wastewater treatment system would concern the responsibility of construction and management, and the sharing of costs. Thus, in those cases, investment in individual wastewater treatment plants for each enterprise proved to be much easier.

Sixthly, the construction of wastewater treatment plants (both centralized and decentralized) depends on relocation and rehabilitation strategies and policies of the City. Although the policy of relocating polluting industrial factories is relatively apparent, its implementation is still insufficient. This has caused insecurities when enterprises plan their environmental protection strategies (including wastewater treatment strategy). Some enterprises wait passively for the relocation request into an industrial zone. Therefore, they do not show any intention or interest for installing a wastewater treatment facility at their current places (see chapter 5).

Finally, pressures to implement laws and regulations are not really strong in several districts and wards. In the case of the alcohol production village at Ward 19, District Tan Binh, there existed a plan to establish a centralized wastewater treatment plant. Unfortunately, due to lack of commitment and awareness of authorities as well as lack of respect for and implementation of legislation among enterprises, this plan was not implemented.

6.3 DECENTRALIZED END-OF-PIPE TREATMENT APPROACH

6.3.1 Description of Case Studies

6.3.1.1 General information

After analyzing exiting data, and having received suggestions from district officials, 120 enterprises in three districts (District 11, Tan Binh and Thu Duc District) were selected, with a focus on potentially polluting industrial sectors. These sectors are: chemistry, textile dyeing, tanning, mechanics, glass, plastics, rubber, food beverage, and paper. Most of the enterprises are small and medium-sized. In surveying, in total 100 questionnaires were sent to enterprises. This was less than intended since some enterprises appeared to have closed, or moved to other places, or in some cases their addresses could not be found at the time of research. The response from SMEs is 48% (see the list of these enterprises in Appendix 5), including 16 from District Tan Binh,

23 from District 11, and 9 from District Thu Duc.[114] The general information is presented in Table 6.5.

Table 6.5 General information from surveyed SMEs

No.		Tan Binh District	District 11	Thu Duc District	Total	Percentage (%)
1	**Number of surveyed SMEs**	16	23	9	48	100
2	**Industry**					
	Dyeing textile	2	0	0	2	*4*
	Paper	1	0	1	2	*4*
	Rubber	7	0	1	8	*16*
	Food production	3	0	0	3	*6*
	Tapioca production	0	0	7	7	*15*
	Plastics	1	16	0	17	*35*
	Mechanics	0	4	0	4	*8*
	Glass	0	3	0	3	*6*
	Others	3	0	0	3	*6*

In their manufacturing process, these SMEs cause negative environmental effects in terms of air and/or water pollution to the surrounding environment. A list of enterprises that had received complaints or fines (up to June 2003), and other environmental control information gathered from surveys and inspections, is provided in Table 6.6.

[114] The reasons for non-response may be: a) they are not familiar with such interviews; b) they think that it disturbs their production; c) lack of time; or d) they are afraid of their insufficiency in pollution control; etc.

Table 6.6 Complaints, fines and pollution sources at 48 selected enterprises *(until 2003)*

No.	Name	Prior to treatment			After treatment		
		Number of complaints	Number of fines	Fines (millions VND)	Cause	Number of complaints	Number of fines
Tan Binh District							
1	TAN PHU CUONG – Dyeing	2	1	3	Air emission	-	-
2	PHUOC THINH - Dyeing	2	1	3	Air emission	-	-
3	HAI THANH - Paper	2	1	3	Air emission, dust	0	0
4	VIET PHAT - Tires	1	1	3	Air emission	-	-
5	DONG NAM – Mousse	5	0	0	Dust	1	0
6	DAN CUONG - Mousse	2	0	0	Dust, noise	1	0
7	LIEN A - Mousse mattress	1	1	4	Air emission	-	-
8	MY NGOC – Malt candy	1	1	3	Air emission	0	0
9	LIDA - Beer	1	1	3	Air emission	-	-
10	THANG LOI - Plastic	1	1	3	Air emission	-	-
11	TAN TAI - Paint	1	1	3	Air emission	-	-
12	PHUOC THANH – Industrial cotton	1	1	3	Air emission	0	0
District 11							
13	TAN LIEN HUNG – Recycle PVC pipe	1	1	3	Noise	0	0
14	TAN TIEN – Exhaust pipe	2	1	4	Wastewater	0	0
Thu Duc District							
15	VIET HUNG – Rubber glove	3	2	8	Wastewater	-	-
16	HUONG QUE - Tapioca	1	1	3	Wastewater	-	-
17	HOA SEN - Tapioca	1	1	3	Wastewater	0	0
18	HAO HIEP - Tapioca	1	1	3	Wastewater	0	0
19	NGOC SON - Tapioca	1	1	3	Wastewater	0	0
20	PHUONG LONG - Tapioca	1	1	3	Wastewater	0	0
21	SANG THU - Tapioca	1	1	3	Wastewater	0	0

Notes: ' - ' information was not available and/or interviewees did not answer.

Among the 48 surveyed enterprises, 21 received complaints, 7 of which received complaints more than twice. Significantly, Dong Nam enterprise has received complaints five times. Out of these 21 enterprises, 19 have paid on average VND 3-4 millions (US$ 200-250) per fine after being inspected by the authorities. Air and wastewater pollution were the most common offences.

In some cases, the number of complaints is higher than the number of fines, because often during the first inspection following a complaint, authorities just reminded or required enterprises to follow environmental regulations. If the violation was repeated, a fine was given.

It should be noticed that the regime of inspection and fining varies from district to district, and depends more or less on the personality of the district officials and the policy culture, each district having their own way to resolve complaints and to fine. For instance, the two enterprises Dong Nam and Dan Cuong in Tan Binh district have not been fined, although they both have received many complaints. If they would be situated in another district, they could have been fined, or even have been closed.

6.3.1.2 Environmental protection status in SMEs

Dust and gaseous emission control

Among the 48 surveyed SMEs, 23 (48%) cause air pollution. The emissions were mostly produced by boilers, electric generators, furnaces, drying stoves and some other specific sources. The result of gaseous and dust emission control is summarized in Table 6.7.

Table 6.7 Dust and gaseous emission control

Emission control	Location			Total
	Tan Binh	District 11	Thu Duc	
No. of SMEs having dust and air emission (1)	12	8	3	23
No. of SMEs having emission control (2)	9	5	3	17
No. of SMEs without emission control	3	3	0	6
Proportion of (2) / (1)	75%	62.5%	100%	74%

According to the survey above, approximately 74% of SMEs that produce dust and air emissions, performed control measures. However, most of these control measures were neither adequate nor sufficient. Complete air emission treatment systems (e.g. absorbent cyclone/tower, filter bags) were only installed at a few SMEs. Most of these SMEs had increased the height of their chimneys, so that the maximum emission concentration at ground level is below the legal standards (known as TCVN 5937 – 1995). This method actually does not reduce the pollution load, and can be interpreted as a dilution measure.

SMEs had mainly installed their treatment systems by their own capacity (10 out of 17 cases). External support, especially from government or industrial cooperation, did not seem familiar to them. Only 2 (Minh Quoc and Casting No.1 company) out of 17 (11.8%) received a loan from government[115], while another 2 (Vinh An and To Ky) out of 17 (11.8%) had requested professional advice from the research centres.

The sources of emission and the control measures of all 17 enterprises are described in Table 6.8.

[115] Loan comes from the Industrial Pollution Abatement Fund, which supports investment projects on minimizing pollution and industrial waste treatment in HCMC (see Box. 7.1 in detail)

Table 6.8 SMEs and control measures for dust and gaseous emissions (2003)

No	Name and Type of industry	Dust and gaseous emission control			
		Sources	Control method	Operational cost (US$ per month)	External support
Tan Binh District					
1	LIDA – Beer processing	Boiler	Chimney	none	none
2	TAN PHU CUONG - Dyeing	Boiler	Air washing tower/Absorber	170	none
3	THANG LOI - Plastic	Boiler	Air washing tower/Absorber	270	none
3	VIET PHAT - Tyres	Boiler, compressor	Air washing tower/Absorber	43	none
5	MY NGOC - Malt candy	Boiler	Air washing tower/Absorber	33	b, c
6	HAI THANH - Paper	Boiler	Air washing tower/Absorber	33	none
7	LIEN A – Mousse mattress	Boiler	Emission treatment system	200	none
8	PHUOC THINH – Dyeing	Boiler	Emission treatment system	200	none
9	DAN CUONG – Plastic	Boiler	Chimneys	55 (*)	b
District 11					
10	TO KY – Glass container	Furnace	Air washing tower/Absorber	180	e
11	VINH AN - Glass	Power generator, burner	Air washing tower/Absorber	73	e
12	TIEN PHONG - Glass	Power generator, burner	Chimneys	330 (*)	d
13	CASTING No.1 Company	Smelter	Air washing tower/Absorber	670	a
14	LAM QUOC HUE - Plastic	Furnace	Emission treatment system	40	none
Thu Duc District					
15	DONG NAM - Paper	Boiler	Chimneys	240 (*)	none
16	MINH QUOC – Tapioca processing	Grinder	Emission treatment system	150	a
17	VIET HUNG – Rubber glove	Boiler	Emission treatment system	800	none

Notes: External support

a – Government

b – Private

c – Industrial and Trading Cooperation

d – Other enterprises

e – Research centre

(*) In fact, these costs could not be as high as reported, even when the costs of maintaining the chimneys are including.

Wastewater pollution control

From this survey, 18 enterprises (37.5%) released industrial wastewater during their operation. The characteristics of raw wastewater, which varies largely, depend on the enterprise's scale, raw material resources, production technology, etc. Raw wastewater characteristics of some main types of SMEs in HCMC are presented in Table 6.9.

Table 6.9 Raw wastewater characteristics of SMEs[116]

No	Type of industry	pH	BOD_5 (mg/l)	COD (mg/l)	SS (mg/l)	Average flow rate (m^3/day)
1	Textile and Dyeing	7-12	300 -650	600 - 1200	100 - 250	50 - 500
2	Paper and Recycled paper	6-10	300-1200	500 - 1500	500 - 1250	20 - 200
3	Tapioca processing	5-7.5	800 - 1800	1500 -2500	200 - 500	20 - 200

Wastewater treatment at SMEs was investigated and summarized in Table 6.10. According to the results, 15 (83%) out of these 18 enterprises discharging industrial wastewater had installed wastewater treatment systems (Table 6.10).

Table 6.10 Wastewater control status

Industrial wastewater control	Location			Total
	Tan Binh	District 11	Thu Duc	
SMEs having wastewater discharge (1)	6	3	9	18
SMEs having wastewater control (2)	4	3	8	15
SMEs without wastewater control	2	0	1	3
Proportion of (2)/(1)	67%	100%	89%	83%

Wastewater treatment technology depends on the type of industry, and enterprise characteristics such as scale, financial capacity, availability of land for installation of a treatment system, and receiving water. The wastewater treatment technologies applied in some main SMEs in HCMC are introduced below[117]:

[116] Source: Personal interview with Dr. Nguyen Phuoc Dan, specialist on wastewater treatment field, Deputy Head of Environment Faculty of the Polytechnic University in HCMC (2005).

[117] Source: Personal interview with Dr. Dan and survey data.

Textile and dyeing industry

Effluent standards - Class C ($BOD_5 \leq 100$ mg/l; COD ≤ 400 mg/l; SS ≤ 200 mg/l)

Wastewater → *Bar rack* → *Equalization tank* → *Rapid mixer* (*) → *Flocculator* (**) → S*ettling tank* → *Receiving Water* (City sewer)

Chemical sludge from settling tank → *drying bed* → sludge cake transported to landfill.

Note: (*) Coagulants and lye or acid are added into rapid mixer.

(**) Coagulants normally used are aluminum sulphate and ferro chloride

Batch treatment, in which rapid mixing, flocculation and sedimentation are run in one tank, is used in small-scale industries (<100 m^3/day)

Effluent standards - Class B ($BOD_5 \leq 50$ mg/l; COD ≤ 100 mg/l; SS ≤ 100 mg/l)

Wastewater → *Bar rack* → *Equalization tank* → *Neutralization tank* → *Primary settling tank* (required as SS > 200mg/l) → *Aeration tank (such as activated sludge or trickling filter)* → *Secondary settling tank* → *Rapid mixer* → *Flocculator* → *Tertiary Settling tank* →*Receiving water*

Chemical sludge and excess sludge from all sedimentation tanks → *De-watering (drying bed or belt press)* → Sludge cake transported to landfill.

Paper industry (raw materials are various wasted papers or paper pulps)

Effluent standards - Class C ($BOD_5 \leq 100$ mg/l; COD ≤ 400 mg/l; SS ≤ 200 mg/l):

Wastewater → *Bar rack* → *Pump sump* → *Medium/fine screen* (*) → *Equalization tank* → *Rapid mixer* (*) → *Flocculator* (**) → S*ettling tank* → *Water Receiver* (City sewer)

Chemical sludge from Settling tank → *Drying bed* → Sludge cake transported to landfill.

Note: (*) Screenings that are mainly paper pulp from bar rack and fine screen can be reused

(**) Coagulants and Alkaline or acid are added into rapid mixer.

Batch treatment, in which rapid mixing, flocculation and sedimentation are run in the only tank, is used for the small-scale industries (<100 m^3/day)

Effluent standards - Class B ($BOD_5 \leq 50$ mg/l; COD ≤ 100 mg/l; SS ≤ 100 mg/l):

Wastewater → *Bar rack* → *Pump sump* → *Medium/fine screen* → *Equalization tank* → *Aeration tank* → *Settling tank* → *Receiving water*

Excess sludge from Settling tank → *Dewatering (drying bed)* → Sludge cake transported to landfill.

Screenings from bar rack and medium screen can be reused.

Tapioca/seafood processing industry

Effluent standards - Class C ($BOD_5 \leq 100$ mg/l; COD ≤ 400 mg/l; SS ≤ 200 mg/l):

Wastewater → *Bar rack* → *Pump sump* → *Equalization tank* → *Settling tank* → *Anaerobic treatment (UASB or Anaerobic filter)*[118] → *Receiving water* (City sewer)

Fresh sediment from Settling tank → *Drying bed* → Sludge cake transported to landfill.

Effluent standards - Class B ($BOD_5 \leq 50$ mg/l; COD ≤ 100 mg/l; SS ≤ 100 mg/l):

Wastewater → *Bar rack* → *Pump sump* → *Medium/fine screen* → *Equalization tank* → *Primary settling tank* → *Anaerobic treatment (UASB or Anaerobic filter)* → *Aeration tank (AS)* → *Secondary settling tank* → *Receiving water*

Sludge from the settling tanks → *Sludge stabilization* → *Dewatering (drying bed)* → Sludge cake transported to landfill.

All 15 SMEs having industrial wastewater control measures are listed in Table 6.11, including related information.

Table 6.11 SMEs with wastewater control measures

No.	Name and Type of industry	Wastewater control					
		Domestic waste water (m^3/day)	Industrial Waste water (m^3/day)	Receiving water	Required Effluent standard TCVN 5945-type	O&M cost (US$ per month)	External support
District Tan Binh							
1	TAN PHU CUONG - Dyeing	-	18	Shared drain	-	170	none
2	HAI THANH - Paper	-	60	Shared drain	B	330	none
3	LIEN A - Mousse mattress	1	3	Shared drain	B	400	none
4	PHUOC THINH – Dyeing	3	300	Shared drain	B	1730	none
District 11							
5	LE AN DIEM – Plastic grinding	4	10	-	-	-	-
6	TAN TIEN – Exhaust pipe of motor cycle	-	-	Shared drain	-	-	none
7	VINH AN - Glass	-	55	Shared drain	-	400	d
District Thu Duc							
8	MINH QUOC – Tapioca processing	6	15	-	C	20	a, b
9	HUONG QUE – Tapioca processing	5	25	Shared drain	C	-	e
10	HOA SEN – Tapioca processing	2	15	-	C	200	a

[118] For tapioca processing, wherever there is enough available land, the following technology is preferred: *Wastewater* → *Sedimentation basin* → *Anaerobic ponds* → *Facultative ponds* → *Polishing ponds* → *Receiving water*

No.	Name and Type of industry	Wastewater control					
		Domestic waste water (m^3/day)	Industrial Waste water (m^3/day)	Receiving water	Required Effluent standard TCVN 5945-type	O&M cost (US$ per month)	External support
11	HAO HIEU – Tapioca processing	1	15	Shared drain	C	200	a
12	NGOC SON – Tapioca processing	-	14.4	-	C	270	-
13	PHUONG LONG – Tapioca processing	3	30	-	C	200	-
14	SANG THU – Tapioca processing	-	25	Shared drain	A	80	c
15	VIET HUNG – Rubber glove	10	50	River	B	507	none

Notes: ' - ' information was not available and/or interviewees did not provide further information.

External support:

a – Government

b - Private

c – Industrial and Trading Cooperation

d – Other enterprises

e – Research centre

Based on the Table 6.11, with a larger flow rate (300m^3/day), Phuoc Thinh Dyeing medium-sized enterprise has to pay more monthly operational and maintenance cost than Tan Phu Cuong Dyeing small-scale enterprise (18m^3 of wastewater/day). However, in comparison of abatement efficiency, the operational and maintenance cost per m^3 treated wastewater of Tan Phu Cuong (US$ 0.36/m^3) is higher than that of Phuoc Thinh (US$ 0.22/m^3). This is according to expectations: small-scale treatment plants are relatively more expensive in term of operational and maintenance cost. With regard to the tapioca processing enterprises, the average operational and maintenance cost per m^3 treated wastewater for 3 out of 7 enterprises is around US$ 0.51-0.72/m^3. However, these costs are higher than the average costs for the sector (see Table 6.15); Sang Thu and Phuong Long enterprises paid approximately the average costs (US$ 0.12/m^3 and US$ 0.25/m^3 respectively), while Minh Quoc enterprise paid the least (US$ 0.05/m^3). It is obvious that the level of operational and maintenance cost is different from enterprise to enterprise; costs depend on management performance, applied treatment technology, and backwardness of the treatment system) (for a further evaluation, see 6.3.2.1)

Environmental quality monitoring results at some SMEs

In order to identify pollution load and level of compliance with environmental standards and legislations, and therefore to evaluate the effectiveness of treatment applied by the selected enterprises, the research has monitored emission sources and collected wastewater samples from 10 (out of 48) enterprises, which together form a representative sample for the various types of industry**.**

Results of gaseous emission monitoring after treatment of seven selected enterprises are shown in Table 6.12.

Table 6.12 Results of gaseous emission monitoring after treatment *(this research, 2003)*

No.	Name and Type of industry	Loca-tion	Source	Temp. ^{0}C	Q (m^3/h)	Concentration (mg/m^3)			
						Dust	SO_2	NO_x	CO
1	Hai Thanh - Paper	TB	Boiler	159	2500	31	371	331	285
2	Lien A – Mousse mattress	TB	Boiler	118	1750	21	365	177	26
3	Tan Phu Cuong - Dyeing	TB	Boiler	84	800	22	505	215	86
4	Lida - Beer	TB	Boiler	97	500	44	420	184	95
5	Thang Loi EVA - Plastic	TB	Boiler	86	1750	28	475	198	39
6	Viet Hung – Rubber glove	TD	Boiler	138	4750	32	611	172	150
7	Tien Phong - Glass	D. 11	Furnace	112	2500	41	412	224	130
TCVN 5939-1995 – B						**400**	**500**	**1000**	**500**

In general, most of the emission concentrations after treatment complied with recent VN environmental standards. There were only 2 out of 7 enterprises that exceeded the SO_2 concentration requirement of TCVN 5939 – 1995. But it is essential to mention again that this is only valid when the treatment systems are working.

The level of contamination in treated wastewater of three selected enterprises was analyzed and the results are shown in Table 6.13.

Table 6.13 Results of Treated Wastewater Quality Analysis *(this research, 2003)*

No.	Name and Type of Industry	Loca-tion	Q (m3/day)	Parameters					
				pH	SS	COD	BOD_5	Total N	Total P
1	Viet Hung Rubber	TD	50	6.7	108	122	70	48	0.4
2	Huong Que Tapioca	TD	25	6.8	138	116	67	38	0.7
3	Ngoc Son Tapioca	TD	14.4	7.2	118	67	38	31	0.5
TCVN 5945-1995 Class B[119]				5.5-9	100	100	50	60	6
TCVN 5945-1995 Class C[120]				5.5-9	200	400	100	60	8

[119] Industrial waste waters containing the values of parameters and concentration of substances which are lower than or equal to those specified in TCVN 5945-1995-B are only discharged into the water bodies using for navigation, irrigation purposes or for bathing, aquatic breeding and cultivation.

The SS, COD, and BOD_5 concentrations did exceed the standard TCVN 5945-1995-B, but met the standard TCVN 5945-1995-C which is required to Huong Que and Ngoc Son enterprises (see Table 6.10). The nature of their wastewater treatment systems is described in Footnote 102.

6.3.1.3 Sub-case study: Hai Thanh Paper Carton Company

General information

Hai Thanh Paper Carton Company is selected as case study (also included in Table 6.11. and 6.12) to understand the benefits and drawbacks of installing a decentralized EoP treatment system in detail. Company's general information is presented in Box 6.3, Tables 6.14 and 6.15.

Box 6.3 General information Hai Thanh enterprise

Hai Thanh enterprise produces recycled paper. It is located in a mixed industrial and residential area, and occupies an area 720 m^2 of which 680 m^2 is used for manufacturing. Hai Thanh is an SME with an invested capital of VND 3.5 billions (US$ 230,000), including VND 3 billions (US$ 200,000) of fixed capital and VND 0.5 billions (US$ 30,000) of operational capital.

Operating time: 20 hrs/day, 26 days/month

Employees: 8

Capacity: 600 tons of paper rolls/year

Operating process

The flow sheet of the company is described in Figure 6.2.

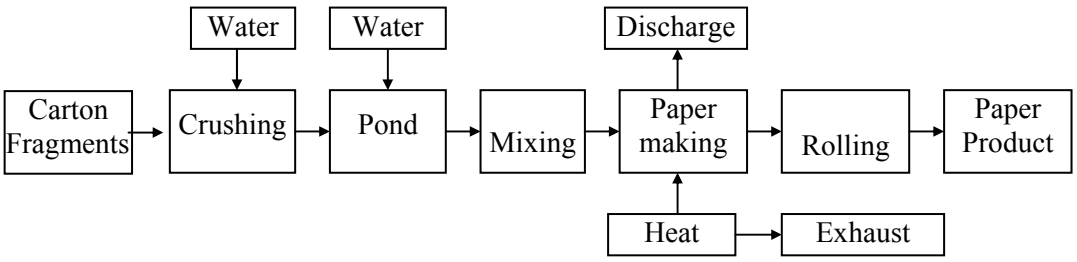

Figure 6.2 Flow sheet of the production process at Hai Thanh Company

[120] Industrial waste waters containing the values of parameters and concentrations of substances which are greater than those specified in the column B but not exceeding those specified in TCVN 5945-1995-C are only discharged into specific water bodies (such as sewers, shared drains, etc.) permitted by authorities.

Industrial waste water containing the values of parameters and concentrations of substances which are greater than those specified in TCVN 5945-1995-C shall not be discharged into any surroundings.

Table 6.14 Input material in operating process of Hai Thanh Company

Type	Unit	Used quantity (per month)	Sources
Carton fragment	tons	65	Market
Aluminum sulphate	kg	500	
Coal	tons	15	Market
Electricity	kWh	60,000	Utility company
Water	m^3	1,800	Utility company

Table 6.15 Main equipment used in the operating process of Hai Thanh Company

Machine	Quantity	Status
Large paper making machine	1	Self designed and constructed, being in use since 1999
Small paper making machine	1	Self designed and constructed, being in use since 1990
Netherlands crushing machine	4	Self designed and constructed, being in use since 1990
Hydraulic crushing machine	1	Self designed and constructed, being in use since 1999
Disc crushing machine	1	Self designed and constructed, being in use since 2002
Boiler 1.5 tons	1	Self designed and constructed, being in use since 2002

Effect and Effectiveness Evaluation

Hai Thanh Paper factory has a capacity of producing 600 tons of various types of recycled paper per year. It uses a boiler to supply steam for production. In burning coal for heating the boiler (0.6 ton of coal per day), it releases dust and air pollutants, which cause complaints from surrounding inhabitants.

In resolving offences of environmental regulations, the authorities usually have to inspect several times. An inspection team usually includes representatives of the district's environmental management section and/or DONRE's officials, a local PC's official, and even representatives of the complaining people may take part in the inspection. If necessary, technicians of a laboratory such as the Institute of Environment and Resources (IER), Centre of Environmental Technology and Management (CENTEMA) or the Environmental Protection Centre (EPC) could be invited to attend the inspection for technical assistance. At the first inspection, authorities often remind enterprises to follow environmental regulations. If a violation repeats, a fine will be applied at the second inspection. If the enterprise's

environmental performance does not improve after that, the level of the fine is increased.

Returning to our case study: as a result of two complaints from surrounding inhabitants about environmental violations up to date, Hai Thanh factory was fined a total of VND 3 millions (US$ 200). On top of that the company was charged the expenses for air pollution measurement amounting to VND 6 millions. Willing to be free from complaints and preventing a larger fine, the factory has invested VND 15 millions (around US$ 1,000) for installing a wet absorption tower to control dust and gaseous emissions, paying an extra VND 0.5 millions/month to operate the system (such as cost for electric power, water).

See Tables 6.6, 6.8, 6.11 and 6.12, for related information about Hai Thanh's pollution control status.

Ambient air pollutant concentrations in the surrounding of Hai Thanh Paper factory were monitored after the air pollution control facility had been installed and are shown in Table 6.16. The pollutants concentration in ambient air surrounding the factory complied with the environmental requirements, except for the dust concentration. However, based on the observation in situ, the prevailing dust concentrations were mainly due to the effect of local transport activities, and not so much following industrial activities of Hai Thanh.

Table 6.16 Ambient air quality surrounding Hai Thanh factory *(this research, 2003)*

Locations surround Hai Thanh Paper Factory	**Air pollutant concentration** (mg/m^3)			
	Dust	**SO_2**	**NO_2**	**CO**
House no. 30/3A	0.64	0.328	0.135	12.6
House no. 31/14B	0.33	0.219	0.076	7.3
House no. 29/27A	0.37	0.299	0.115	9.1
House no. 23/1	0.36	0.255	0.106	10.9
TCVN 5937- 1995 Standard	**0.3**	**0.5**	**0.4**	**40**

Besides air pollution control, Hai Thanh also faced an industrial wastewater problem (releasing 60 m^3/day). The enterprise established a wastewater treatment system costing around VND 250 million (~ US$ 16,000). Its treated wastewater meets the standard TCVN 5945-1995-B (see Table 6.11). Operational costs are 5 millions VND/month (~330 US$/month).

Through installing and operating these EoP treatment facilities, Hai Thanh's environmental situation has improved considerably and as a consequence surrounding inhabitants are no longer complaining, so far.

Remarks

Besides investment cost, operating EoP treatment systems costs Hai Thanh enterprise VND 5.5 million (US$ 355) per month. These costs could be counted as an internalized cost and increase the product price. Of course, no business wants to get this burden and they try to avoid it as much as possible. That is a reason that, as

described elsewhere, enterprises often have a tendency of operating their treatment facilities only when inspected. In other words, it shows the necessity of enforcement and supervision ability of authorities.

In the case of Hai Thanh, this enterprise has to face two external pressures. Firstly, pressures come from complaints on environmental pollution from surrounding inhabitants who have become supervisors to monitor the enterprise's pollution abatement activity (for instance the operation of treatment system). This is often followed by other pressures via inspections from local authorities, which are a response to resident's complaint. Fines for violating environmental regulations are so low that these do not affect the behaviour of violators. Secondly, pressures come from the Relocation Programme (see chapter 5), which demands the company to move or even close, if the enterprise cannot improve its pollution situation as requested. Under such pressures, the Hai Thanh enterprise has chosen to establish EoP treatment systems to keep their production in-situ and being secure. In sum, enterprises do invest in pollution control efforts because of the strong monitoring (by communities) and the enhancing enforcement of City environmental policy.

6.3.2 Evaluating the Decentralized End-of-Pipe Approach

6.3.2.1 Effectiveness evaluation

According to results collected from field monitoring, enterprise surveys and in-depth interviews, it can be concluded that the decentralized EoP approach has resulted in some environmental improvement. Specifically, the installment of EoP treatment systems resulted in treated air emissions and wastewater discharges complying with environmental regulations (see Table 6.8 and 6.11).

The field monitoring and enterprises' responses (see Table 6.10) showed that 15 (83%) out of all the water pollution enterprises have installed a facility to control their industrial wastewater[121]. The standard of TCVN 3945-1995 was used to assess the treated wastewater, and the results are shown in Table 6.17.

Table 6.17 Environmental effectiveness of selected industrial wastewater treatment systems

Environmental effectiveness of wastewater treatment systems	Location			Total
	District Tan Binh	District 11	District Thu Duc	
Meeting water quality Class A	0	0	1	**1**
Meeting water quality Class B	3	0	2	**5**
Meeting water quality Class C	0	0	**5**	**5**
Have not achieved Class C	0	0	0	**0**
Not answered	1	3	0	**4**

[121] According to a recent report (in August 2005) of the HCMC Environmental Protection Agency (HEPA), it is considered that total industrial wastewater in HCMC is around 145,000-150,000 m^3/day in which treated wastewater occupied 39-65%, the ratio between number of the enterprises that installed their own wastewater treatment systems and that of the enterprises discharging industrial wastewater is 38-45 %.

As is shown in Table 6.17, 40% of wastewater treatment systems (6 out of 15 systems) achieved discharge class A or B, while 73.3% of the systems (11 out of 15 systems) complied with requirements of class C discharge after treatment. However, 26.7 % (4 out of 15 respondents) did not answer, which may mean their treatment systems did not meet the standards.

The abatement effectiveness of treatment systems depends on a number of factors (e.g. stabilized input wastewater flow (both quality and quantity), suitable treatment technology, proper design and construction, appropriate operation and maintenance, management skill, available chemical and spare-parts, the age of treatment facility, etc.).[122]

This effectiveness could be evaluated indirectly by monitoring the number of complaints of inhabitants (in other words, evaluating through the degree of satisfaction of people) (see Table 6.6). From 32 initial complaints related to environmental pollution of 21 enterprises, the complaints decreased dramatically after polluters had installed EoP treatment systems. In just 2 cases the complaints remained, these were related to two mousse factories due to low treatment effectiveness. Through installing efficient EoP systems, perceived environmental quality in the vicinity and living conditions of surrounding inhabitants have improved considerably.

However, as evaluated in the sub-case study of Hai Thanh enterprise, in practice, incentives for pollution control efforts of SMEs are insufficient. When being asked in a questionnaire if installing an EoP treatment system had increased operation cost, only 3 out of 21 enterprises[123] confirmed. However, in face-to-face discussions, most of the interviewed enterprises admitted that pollution control system construction and operation is expensive. But 8 out of 21 enterprises (38%) argued that the investment in treatment systems and complying with government requirements can help their business to stay free from complaints, inspections, and audits by the authorities. Therefore it ensures a more secure operation of their enterprise.

In addition, investment in environmental EoP systems can provide enterprises with indirect benefits, such as improving their reputation and image. The survey revealed that larger scale enterprises are more interested in their reputation and image than SMEs[124]. Thus, in that respect their willingness to establish an EoP treatment system is larger compared to smaller companies.

6.3.2.2 Cost-effectiveness evaluation

Cost estimations[125] for wastewater treatment systems of SMEs are introduced in Table 6.18 (see also Table 6.11).

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[122] From the view of governmental management, more attention should be paid to the number and size of polluters: it is quicker and more cost-effective to deal with a small number of large firms than with many different small ones.

[123] This figure includes all enterprises having established air and/or wastewater EoP treatment systems, excluding those that have just installed or enlarged chimneys.

[124] A similar consideration was also stated by Pimenova and van der Vorst (2004) and World Bank (1999).

[125] According to Kontogiani et al. (2005), in principle, the total cost of a WWT plant includes the costs of land acquisition, construction, operation and maintenance. The economic costs of land depend on the required area size, its current and possible alternative future uses and its availability. The construction costs depend on the quality level of wastewater treatment required and the capacity of the installation, as well as a number of individual local factors (e.g.

Table 6.18 Cost estimation for wastewater treatment system of SMEs[126]

No.	Type of industry	Effluent standard, TCVN 5945-1995, **Class**	**Investment cost** US$ /m^3 of wastewater treatment capacity	**O&M cost** US$ /m^3 of treated wastewater
1	Textile and Dyeing	B	300 – 350	0.23 – 0.30
		C	100 – 140	0.20 – 0.25
2	Paper and Recycled paper	B	260 – 310	0.15 – 0.20
		C	120 – 160	0.10 –0.16
3	Tapioca/Seafood processing	B	430 – 480	0.12 – 0.20
		C	250 – 280	0.08 – 0.12

Based on Table 6.18, investment costs in the tapioca processing sector is higher than in paper or dyeing industries, while its operation and maintenance costs are the lowest due to lower consumption of chemicals. The costs for wastewater treatment under Vietnamese conditions (as argued earlier in part 6.3.1.2) depend on a variety of factors: production technology, the type of industry, the scale of production process, the nature of the receiving water to which the treated wastewater is discharged (treatment cost of wastewater discharged into City sewer is lower than that of wastewater discharged into canal or river), applied treatment technology, management performance and the age of treatment system.

Given this argument and due to the lack of resources in terms of time, human and financial budget, this research cannot exactly identify the lowest cost for the investment neither for the operation and maintenance (O&M) of decentralized wastewater treatment plant for each kind of industry in HCMC. However, in comparison of the actual O&M costs in Table 6.11 and the estimated O&M costs in Table 6.18, it shows that (1) the actual O&M costs of dyeing enterprises (0.192 – 0.31 US$/m^3 of treated wastewater) are similar to those estimated in Table 6.18 (0.23 – 0.30 US$/m^3); (2) the actual O&M costs of tapioca processing enterprises vary in a large range of 0.04 – 0.625 US$/m^3 (minimum cost at Minh Quoc and maximum cost at Ngoc Son). These figures differ considerable to those estimated in Table 6.18 (0.08 – 0.12 US$/m^3). Such differences in cost-effectiveness of decentralized wastewater treatment system among tapioca SMEs may be explained by the variety in their personnel and management skill. It is obvious that the level of operational and maintenance cost is different from enterprise to enterprise; these costs also depend on management performance, applied treatment technology, and the age of the treatment system.

On the other side, it must be recognized that because of inadequate financial capacity and lack of strict enforcement by authorities, SMEs usually invest in a temporary wastewater treatment facility with insufficient capacity. Then, due to high operation and maintenance costs (see also Table 6.8 and 6.11), most of treatment facilities are

special site preparations, quality of materials used, tender procedure, housing of process units, etc.). The costs of operation and maintenance include the costs of: Personnel, energy, chemicals, and maintenance.

[126] Personal interview with Dr. Dan N.P. (2005). Similar information on the cost of industrial wastewater treatments in Vietnam can be found on the website http://www.techmartvietnam.com.vn

only operated temporarily whenever authorities inspect. With regard to financial limitation, SMEs rarely establish an EoP treatment system voluntarily, without external pressure.

6.3.2.3 Network analysis

Which actors and stakeholders influence SME's behaviour in the establishing EoP treatment systems? The role of key actors and the interactions between them are analyzed for three networks (see Figure 6.3).

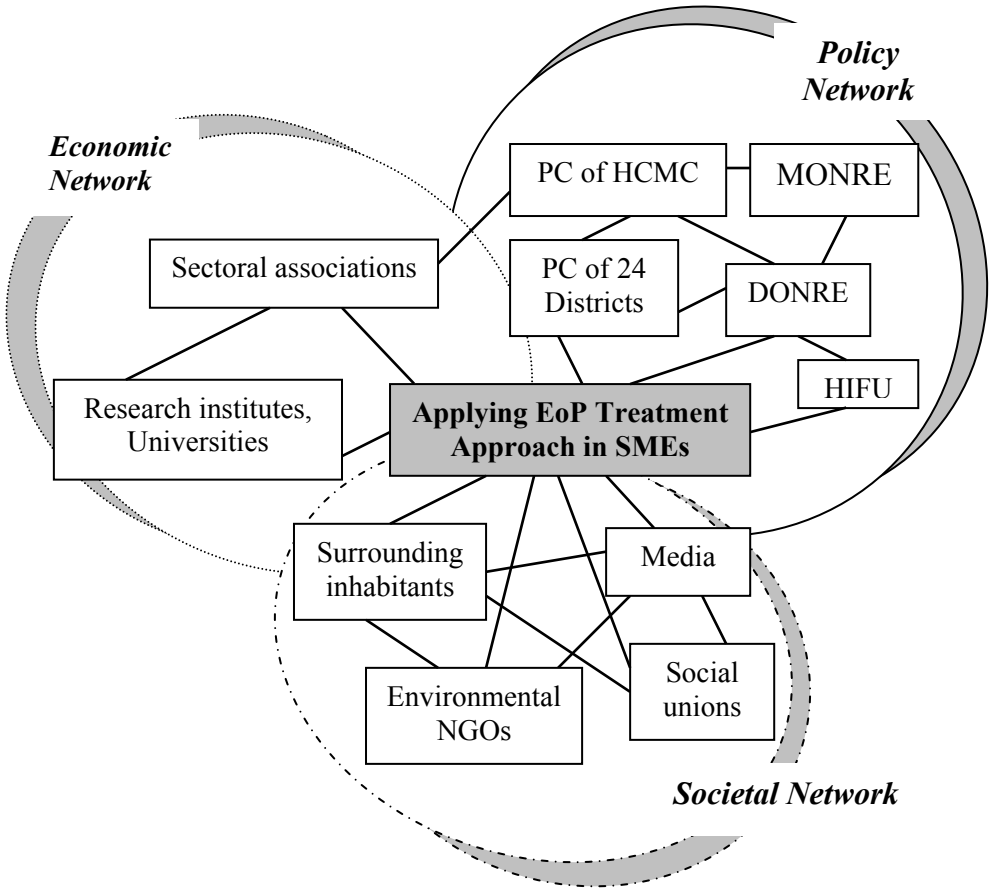

Figure 6.3 Triad networks in applying EoP treatment solution in SMEs

Policy network

A number of scholars (Gärdström and Norrthon, 1994; Blackman, 2000; Evans and Hamner, 2003; Pimenova and Van der Vorst, 2004) appreciate and emphasize the role of local authorities in relation to SME environmental management, because they directly issue business operating permits, represent the communities who live around SMEs, are directly influenced by SME pollution, and gain economic and social benefits from SMEs. For those reasons, local authorities are well situated to govern the environmental performance of SMEs, according to these scholars

In HCMC, the People Committees of Districts are responsible for SMEs in administrative management, and business permitting and licensing. At district level,

the Environmental Group belonging to the Division of Natural Resources and Environment helps the People's Committee in environmental management towards SMEs (see also Figure 2.2).

As evaluated elsewhere, local governments (ward and district levels) are indeed important channels for supervising and enforcing the environmental compliance of SMEs, and form a key external pressure to influence SME environmental behaviour.[127] For instance, in the case of tapioca processing SMEs, under the strict enforcement of Thu Duc District's environmental authority, most of them installed their own wastewater treatment plants (see Table 6.11). When such enforcements and regularly supervisions of authorities are absent, enterprises often tend to ignore their industrial pollution control, even in those cases where treatment facilities already exist.

As described in chapter 5, DONRE which executes the state function of environmental management in HCMC, is a key actor in applying EoP treatment solutions in SMEs. In respect to command-and-control measures, besides responsibility of permitting and formulating environmental strategies, plans and programmes for the city, DONRE cooperates with District's PCs (often represented by the Environmental group) in enforcing and supervising SMEs' environmental compliance, monitoring and measuring emissions, as well as punishing environmental violators. In doing so, pushing for end-of-pipe approaches is very common. At the same time, DONRE in cooperation with universities or research institutes organizes workshops and trainings on EoP treatment technologies as well as on environmental law and regulations to enterprises in the city, including SMEs.

On the other side, although authorities often emphasize on EoP treatment solutions when resolving pollution problems, they consider that the investment of EoP treatment systems is the duty and responsibility of polluting enterprises themselves. City authorities have not invested much on that for SMEs. Table 6.8 and Table 6.11 clearly show that out of the 21 enterprises installing EoP treatment systems, only 4 SMEs (Casting No.1 factory, Minh Quoc, Hoa Sen and Hao Hieu enterprises) (19%) have received support from the City government, including encouragement, supply of environmental law and technological handbook documents, and financial aids[128] to implement their environmental protection programme. Financial support from the government has not really played an important role in EoP pollution control programs for SMEs.

In addition, the weak enforcement of city and district authorities in pollution control activities could be explained by other reasons. In order to secure their production activities, entrepreneurs have to seek close relationships with the administrating forces. According to Heberer and Kohl (1999), 91% of the surveyed SME entrepreneurs regarded a network of personal relations as an important asset for business operations. In this manner entrepreneurs in fact exert power and influence

[127] In line with this suggestion, Blackman (2000) states that enforcement of command-and-control regulations depended critically on peer monitoring and in most cases, local organizations play a key role.

[128] These financial aids come from the Industrial Pollution Abatement Fund which supports the investment projects on minimizing pollution and industrial waste treatment in HCM City. HIFU has management responsibility for this Fund (see Box 7.1).

economic and political decision-making that affect their business to a certain extent. Through these personal relations SMEs have also managed to keep enforcing authorities on a distance. Or as O'Rourke (2002: page 240) states it: "Corruption among poorly paid inspectors only adds to the challenges of regulation".

Economic network

According to the survey, only 2 (My Ngoc, Sang Thu) out of 21 enterprises that installed EoP treatment systems (8%) were supported by industrial and trading associations. In fact, so far such associations play a rather marginal role in the implementation of EoP treatment of SMEs. It seems that they are not interested in command-and-control approaches nor in any environmental reforms. Generally speaking, these associations are usually weak, and there is no institutional arrangement nor mechanisms for policy dialogue between the public and the private sector in which these associations could play a role (cf. GTZ, 2005; for more details see section 7.4.2.2).

Environmental research centres and universities, which are mostly located in the City area, are main sources of information and service on environmental technology to SMEs. These institutions provide many kinds of environmental services. For instance, enterprises can ask consultants for design, design-construction, design-construction-maintenance, or build-operation-transfer of treatment systems. Most of such services often include a training course for operation, management and maintenance of these systems. Some consultants are also chemical suppliers for these systems. In general, with respect to industrial pollution control the relations between authorities, universities/research centres and SMEs are crucial. However, the relation between authority and research institutes/consultants should not become too 'close', as it has the danger of authorities losing their independence when conducting inspections on ineffective treatment systems designed and/or constructed by those consultants. As the community of environmental specialists in HCMC is not that large, mutual dependence is seriously threatening formal control and enforcement. The role of environmental consultants in supporting SMEs is further presented in Part 7.4.2.2.

This survey did not disclose any serious influence of suppliers or customers on SMEs' environmental behaviour in HCMC. Such network dynamics are more likely to be found in developed countries or with respect to large-scale exporting companies in Viet Nam.

Societal network

The case studies reveal that due to limited resources City authorities do not uniformly enforce environmental regulation and standards over all industries. Enforcing efforts are likely to be higher where environmental complaints are more often heard. Complaints do impact inspections significantly (see section 6.3.1.3)[129]. Thus, the role of community in environmental reform should be respected and governments need to encourage citizen involvement in detecting environmental violation. However, due to lack of professional knowledge and equipment, neighbouring communities can only

[129] Similar to this view, O'Rourke (2002: page 237) recognizes that "public pressures appear to be the primary means to motivate state agencies to pressure firms to reduce pollution".

sensorial detect pollution (e.g. bad odour, black smoke, visible waste), while other harmful pollutants or emissions may pass unnoticed. Public disclosure and environmental training programmes can supply communities with basic knowledge and information on environmental pollution, as well as to raise the public awareness on the effects of pollution on environment and health. Here lies a clear task for environmental authorities, in the absence of strong environmental NGOs.

There are, though, social organizations or NGOs that can play a role in effectively bridging this communal capacity gap. For instance, scientists and researchers, as members of City Union of Science and Engineering Associations[130], or students and young Vietnamese environmental volunteers, as members of environmental 'NGOs' (e.g. 'Tri thuc Xanh'- Green Knowledge Club)[131] can assist. They can on the one side enhance the community capacity for supervising, and on the other side help, advice and pressure the authorities in preventing environmental risks and negative impacts. Besides, the role of the more traditional social organizations such as the Women's union and Veterans' union can be important in monitoring environmental pollution and building communal capacity. These unions still have large prestige in many communities and their work often links to daily activities of citizen. Especially women organizations seem to become increasingly involved in environmental projects.

In recent years in HCMC and Viet Nam, 'hot' news related to environmental pollution events such as oil spills, chemical leakages, polluted rivers, contaminated drinking water sources, or environmental complaints from citizens, appear more and more in newspaper columns. Such news does not seem to meet any restrictions and even environmental misbehaviour and poor functioning of authorities is widely quoted.[132] Through pressure on authorities and companies, the media (television, radio and news paper) have increasingly contributed to changing polluters' behaviour and to improving environmental quality. Mol (2005) indicates that "openness and non-state information disclosure on local environmental practices are important channels for the central state[133] to supplement vertical information flows through state structures". While this seems clearly improving Viet Nam and HCMC, there is still a world to win.

In sum, public pressure (from both civil community and media) motivates and enhances the (environmental) governance capacity (more effective, active and transparent) although as O'Rourke's (2002, pp: 240) states "this is a long and slow road" in contemporary Viet Nam.

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130 This organization has been commanded respectfully by the City People Committee as consultant, evaluator or social supervisor in projects on sanitation and environment, anti-flooding, and transportation and construction in HCMC.

131 This NGO has performed some activities on sharing environmental knowledge, calling for more public attention, and encouraging people to join environmental protection in HCMC, Ha Noi, Da Nang (e.g. propagandas or campaigns as "Clean 'Tet' holidays", "World Environmental Day- June 5", "Clean Street, Green Environment" or a programme of understanding and supporting "Orange Agent" victims)

(source:http://www.unep.org/wed/2005/english/PressReleaseHanoi.doc; http://www.hcmuns.edu.vn/DoanTN/?MaTinTuc=232andMaChuDe=12)

132 Similarly, Mol (2005) states that environmental problems are increasingly seen as non-sensitive issues, which make the revealing of environmental accidents, disasters and routine pollutions beyond standards more regular practice in Vietnam.

133 Or leadership of government

6.3.3 Advantages and disadvantages of decentralized end-of-pipe treatment

As presented in Part 6.1, the advantages and shortcomings of EoP measures have been analyzed by a variety of scholars around the world. Based on this survey, those of decentralized EoP treatment in SMEs under HCMC circumstances are discussed here.

Advantages

The study reveals several advantages of decentralized EoP treatment in SMEs.

Up till now, Vietnamese authorities mainly apply command-and-control instrument in the environmental governance and EoP treatment is often seen as a familiar and suitable solution to meet the regulations and standards on pollution control, even when manufacturers apply cleaner production options (see chapter 7). It is obvious that the EoP treatment approach has helped enterprises to put their operations in line with regulatory demands. At the same time it significantly reduces environmental deterioration (that is: when the treatment systems are working adequately).

As discussed elsewhere, SMEs are unwilling to take risks and resist changes in production routines. For those reasons they often accept the EoP treatment solution, because it can relatively easy be added to the production process without any serious effect on routine practices.

The survey also showed that in controlling pollution via EoP, enterprises can avoid complaints from the communities as well as inspections of authorities, they enhance their reputation and image[134] and strengthen the possibility of not becoming relocated (see chapter 5). This all allows them to concentrate more on running their business. Moreover, according to entrepreneurs, when their working environment is improved, the productivity potentially increases, although this would plea more for cleaner production than for EoP measures.

Disadvantages

Besides these advantages, EoP treatment solutions in SMEs bring a number of disadvantages.

As recorded in previous sections, the most highlighted disadvantage of EoP treatment measures in SMEs is high costs. While capital in SMEs is limited, the construction, operation and maintenance of such treatment systems require considerable costs (see Tables 6.6, 6.8, 6.11 and 6.18). Given that and with insufficiently environmental awareness, SMEs rarely establish an EoP treatment system voluntarily, without external pressure.

With respect to overall environmental effects, EoP treatment solutions can cause undesirable side-effects. For instance, in the case of electroplating enterprises, in order to reduce harmful air emissions which contain volatile organic compounds (VOCs)[135] and acid mists, entrepreneurs install a facility through which acid mists and vapours are scrubbed with water before venting to the ambient air. While eliminating

[134] Green Book which introduces to public the symbolic enterprises in environmental performance in HCMC proves it.

[135] Toxic organics such as trichloroethylene, and trichloroethane (cf. World Bank, 1999)

toxicity from the surrounding air, polluted water is discharged freely without any treatment, as such treatment was not requested by un-experienced inspectors.

Another disadvantage of EoP treatment is that its abatement effectiveness depends on three factors: well-designed, well-operated, and well-maintained treatment systems. As evaluated previously, SMEs loose easily industrial pollution control via these EoP systems through lack of financial capacity, lack of skilled personnel and lack of strict enforcement and intensive monitoring. Consequently, the EoP treatment systems rarely ensure the required effectiveness.

In addition, the installation of an EoP treatment system always requires space. This is especially difficulty for SMEs located in densely populated areas, such as the central districts in HCMC.

Finally, when facing strict enforcement of complying to environmental standards and in order to reduce treatment cost, enterprises become creative with regulations. Dilution of air emission or liquid effluents to achieve the required emission standards happens regularly, as well as illegal emissions. As a consequence, such tricks deteriorate environmental quality, although in principal adequate treatment systems are available at the enterprise.

6.4 CONCLUSIONS

This case has investigated and evaluated practical experiences in the application of EoP treatment approaches (both centralized and decentralized model) for SMEs in HCMC.

In general, the research demonstrates that establishing and operating EoP treatment facilities can and does achieve good effects in environmental protection. In a few words, it reduces land contamination, air pollution, surface and ground water pollution from liquid waste, and risks to public health. Also the number of complaints from residents reduced significantly, improving the relationship between industrial manufacturers and surrounding residents. With respect to that, the EoP treatment approach can in principal be seen as a useful industrial pollution control strategy for the City's large number of SMEs.

There have only been few cases that established a centralized wastewater treatment system in the recent 10 years (1993-2003). Although there were a great number of initiatives and plans, the implementation has been delayed, due to several difficulties and constraints as discussed. Applying the centralized treatment model for urban industrial clusters in densely populated areas (as in Districts 11, Tan Binh, and Thu Duc) is in reality impractical. As analyzed in previous sections, establishing industrial zones with effective centralized EoP treatment plants is a more feasible solution for environmental problems. This model can just be successful when there is sufficient awareness, reasonable rehabilitation plans, appropriate management of the treatment system and sufficient state control.

Although the EoP treatment solution is recognized as an important tool in command-and-control based policy, especially under Vietnamese circumstances, many constraints can be identified in the existing (decentralized) EoP treatment policy to

SMEs. Facing financial burdens, having low environmental awareness and knowledge, and lacking strict supervision, intensive monitoring as well as essential supports from authorities, SMEs deliberately neglect EoP pollution control (even when treatment facilities are installed). The investment in a pollution treatment system thus is seen as an obligatory and temporary solution by most SMEs. Given that we could state that the EoP treatment solution for SME environmental pollution in HCMC does not live up to its expected effectiveness.

While the support from City authorities to SMEs in implementing EoP treatment solution up till now is not substantial, this research indicates that the effectiveness of a regulatory strategy on EoP treatment is not dependent on state policies only, but on non-state actors and arrangements too. Although it needs further investigations, good and effective environmental governance in Viet Nam needs the involvement of three clusters of key stakeholders: the state, private sector and civil society.

7. ASSESSING CLEANER PRODUCTION APPROACH

7.1 INTRODUCTION

Cleaner production (CP) consists of eco-efficient oriented approaches and technologies. It has been applied successfully in medium and large-scale industries and became a regular practice in business operations around the world (DOSTE, 1999, Frijns and Van Vliet, 1999; Ciccozzi et al., 2002; Evans and Hamner, 2002; UNEP, 2002).

However, the application of CP concepts in small-scale industries has not been substantial. Authors such as Chandak (1994), Gärdström and Norrthon (1994); Frijns and Van Vliet (1999); Frijns (2000), and Visvannathan and Kumar (1999) reveal the distinct characteristics of SMEs that are major internal hurdles for the adoption of cleaner production such as lack of time, money, knowledge/methodology, involvement of employees in decision-making on process changes and environmental protection awareness. External constrains for CP introduction include governmental barriers (such as pricing, policy of water, regulatory emphasis on end-of-pipe treatment approach, low waste disposal charges, lack of financial incentives or funding) and other barriers (such as lack of public pressure, lack of information and lack of market demand).

In recent years, beside traditional pollution control measures such as end-of-pipe treatment, closure of companies and punishment of polluting industries, and through some demonstration projects supported by international organization such as UNIDO, SIDA, US-AEP, ADEM, and UNDP, cleaner production has emerged as a promising measure to control industrial pollution in HCMC, first toward large industries and more recently also with respect to SMEs.

In assessing the effectiveness of the CP approach in HCMC, this chapter firstly gives an overview of the cleaner production approach including its concepts, and the general situation of cleaner production application in the world, in Viet Nam and in HCMC. Secondly, the chapter evaluates the cleaner production performance in HCMC (as a case study), based on the results of on-site survey of 19 enterprises and interviews to three main groups including enterprise's managers, governmental officials, and consultants. This section aims to understand the advantages and constraints of cleaner production implementation at the company level, and then, through a network analysis, analyze the rules and resources in networks, such as relationships between governmental organizations, consultant services and business. Last of all, the chapter draws conclusions and gives recommendations on how to

apply cleaner production into SMEs according to the conditions and circumstances in HCMC.

7.2 OVERVIEW OF CLEANER PRODUCTION APPROACH

7.2.1 Definition

The term *Cleaner Production* has become generally used through the efforts of the UNEP Cleaner Production Program, established in 1989. A number of related terms are used as well, including low or no-waste technologies; waste minimization (India); waste and emissions prevention (Netherlands); source reduction (United States); eco-efficiency (World Business Council on Sustainable Development) and environmentally sound technology (United Nations Council on Sustainable Development). All these terms essentially refer to the same idea of integrating pollution reduction into the production process and even into the design of products (World Bank Group, 1998). In general, the UNEP defines cleaner production as the continuous application of an integrated preventive environmental strategy applied to processes, products, and services to increase overall efficiency and reduce risks to humans and the environment.

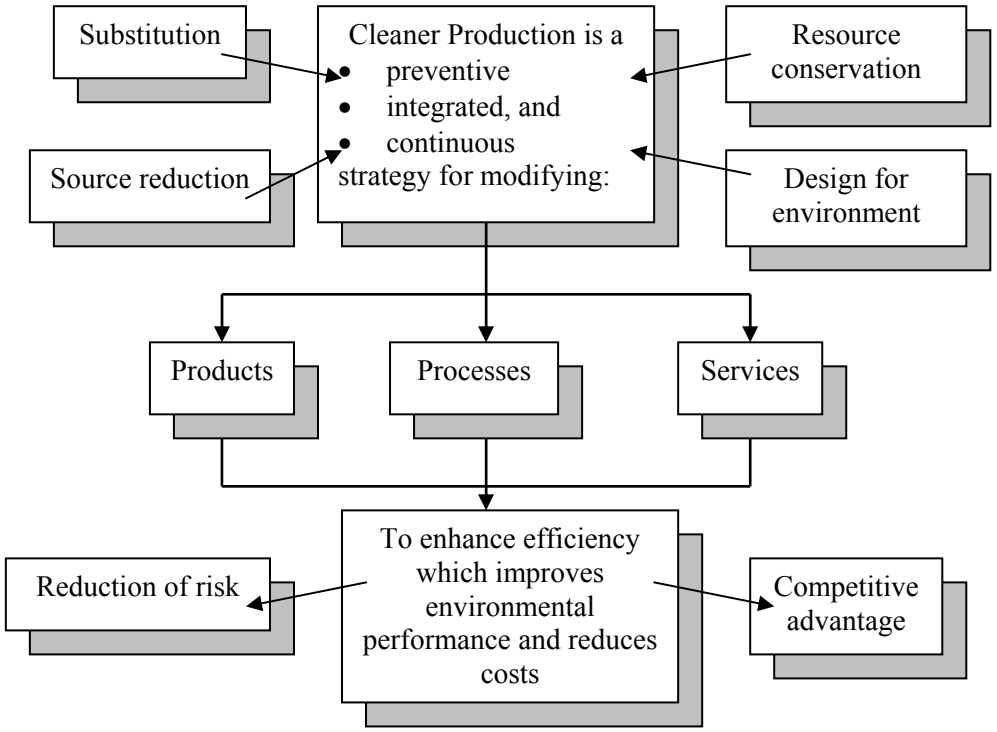

Figure 7.1 What is cleaner production?[136]

Cleaner production requires changing attitudes, exercising responsible environmental management and promoting technology change. For production processes, cleaner production aims to reduce the consumption of raw materials and energy used in the production of one unit of product; to eliminate - as far as possible - the use of toxic and dangerous materials; and to reduce at source the quantity and toxicity of all emissions and waste generated and released. For products, cleaner production aims to reduce the environmental, health and safety impacts of products over their entire life cycle from raw materials extraction, through manufacturing and use, to the ultimate' disposal of the product. For services, cleaner production implies incorporating environmental concerns into the design and delivery of services.

7.2.2 Cleaner production assessment methodology

There are many different methodologies to assess cleaner production in the world. In general, four basic methodologies should be considered: the cleaner production assessment methodology of US-EPA, the CP assessment methodology of UNEP and UNIDO, the DESIRE[137] methodology of the Indian National Cleaner Production Council (INCPC) and the cleaner production assessment methodology of World Environment Centre (WEC). However, the heart of any methodology to implement cleaner production is essentially to identify promising options, mostly based on a systematic description of the flow of mass and energy in a company and an evaluation of the efficiency of the use of materials, water and energy (Fresner, 2004).

The DESIRE methodology, which divides cleaner production process into six phases and 18 tasks, has been applied in the majority of the demonstration projects in Viet Nam. This methodology is introduced in Figure 7.2.

[136] Source: Strahl, J. (1996), in: Rodhe , 2000.
[137] DESIRE is abbreviated from the name of '**De**monstration in **S**mall **I**ndustries for **R**educing Wast**e**' project, which was started in early 1993 in India with help from UNIDO.

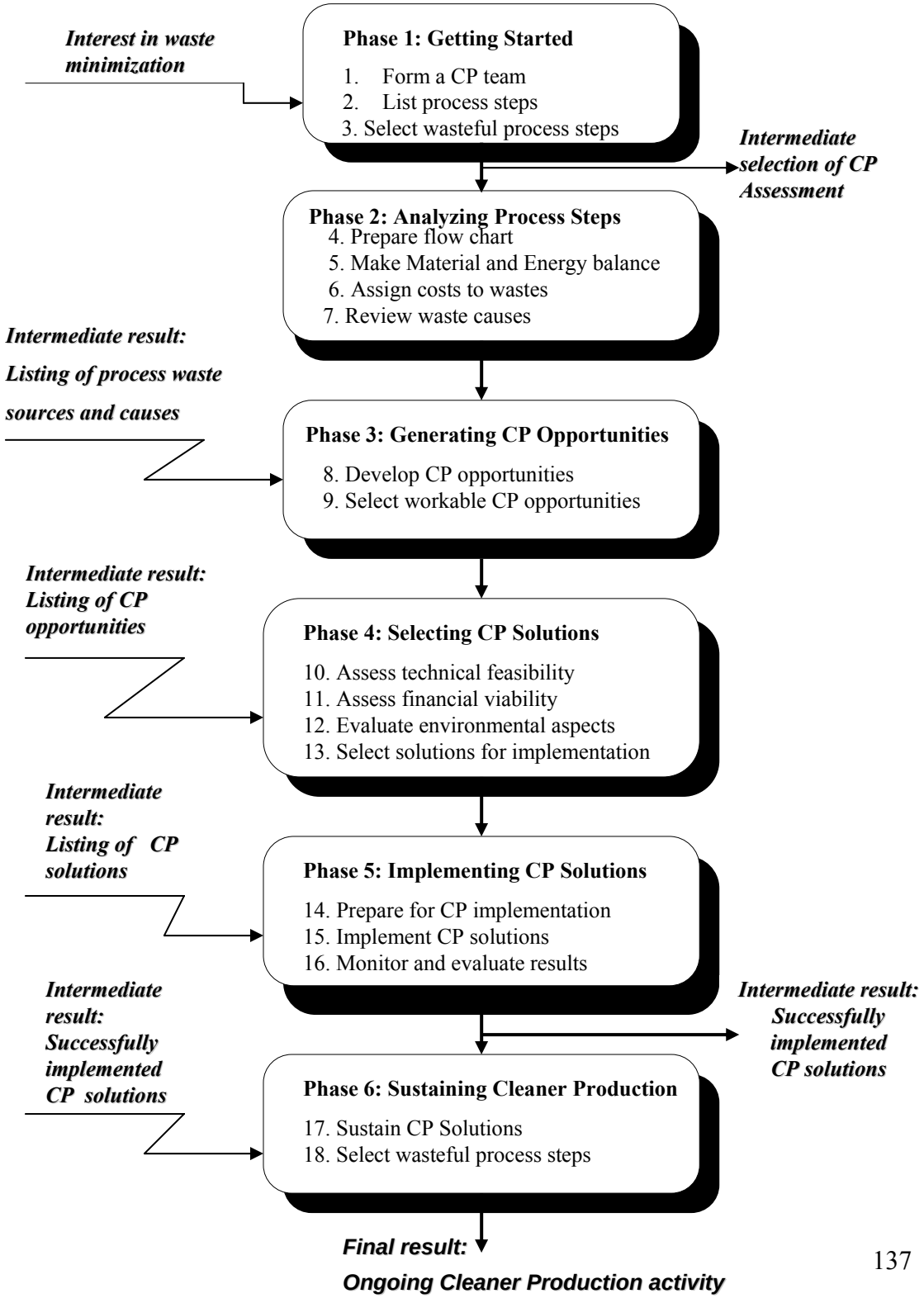

Figure 7.2 Systematic procedure of cleaner production assessment

7.2.3 Cleaner production around the World – Major achievements

In 1992, CP was highlighted at the Earth Summit as an important concept and strategy to proceed the concept of sustainable development. There, the United Nations endorsed the Agenda 21 - a blueprint for Sustainable Development. Its chapter 34 mentions "Environmentally sound technologies (ESTs) protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they were substitutes" and calls on to "promote, facilitate and finance as appropriate, the access to and transfer to ESTs and corresponding know-how, in particular to developing countries…" (cf. UN, 1992).

Before that, in the years 1985-1990, the application of cleaner production on production processes has been applied strongly in developed countries, such as the Netherlands, Denmark, United States, Canada, and Sweden. For instance, one well-known pioneering project is the Project on Industrial Successes with Waste Prevention (PRISMA), initiated in 1985 by the Netherlands Organization of Technology Assessment. In 1988, through the preliminary results of field research started in 10 companies, it showed that no less than 164 prevention options were identified. In 30% of the cases these options were in the category of good housekeeping; another 30% in substitution to material and raw materials; 30% in changes in equipment; and the rest in process modifications. The experiences in the Netherlands show that pollution prevention can result in a reduction of 30-80% of separate waste flows at low costs and with net benefits, depending on the particular company. The use of alternative raw materials resulted in a 100% reduction in emissions of substances such as cyanide (in zinc plating) and solvents (Nielsen et al., 1994; El-Kholy, 2002).

Being encouraged by the initial successes at cleaner production approach-based projects, such as PRISMA in the Netherlands, Landskrona in Sweden, SPURT in Denmark, AIRE/CALDER and Catalyst in the UK, a number of demonstration projects have been implemented subsequently in developing countries with support of international organizations (UNIDO, UNEP) and developed countries (Netherlands, Austria, USAID, Sweden). Examples include the DESIRE project in India, ProduksiH in Indonesia, PRIME in the Philippines and SEAM in Egypt (cf. UNEP, 2002).

For obtaining a commitment to CP over a wide section of the stakeholders, in 1998 UNEP launched an International Declaration on Cleaner Production (IDCP). As of March 2002, according to UNEP (2002), the IDCP had over 300 signatories and has been translated into 15 languages. An important point to note about the IDCP is that it

is not limited to national governments but may also be signed by companies, universities, associations and individuals.

In order to build national capacities on cleaner production, UNIDO and UNEP have worked together on the establishment of National Cleaner Production Centers (NCPCs) in both developing countries and countries in transition. Twenty four NCPCs have been established since 1994 in the following countries: Brazil, China, Costa Rica, Czech Republic, El Salvador, Ethiopia, Guatemala, Hungary, India, Kenya, Korea, Lebanon, Mexico, Morocco, Mozambique, Nicaragua, Slovak Republic, South Africa, Sri Lanka, Tanzania, Tunisia, Uganda, Viet Nam, and Zimbabwe. The purpose of NCPCs is to build local capacity to promote and implement preventive environmental approaches, especially cleaner production**.** Their focus is not on mitigation or end-of-pipe treatment and disposal of wastes, which other institutions are already promoting. The Centres (and the personnel trained by them) do not deliver ready-made solutions; rather they train and advise their clients on how to find the best solutions for their specific problems. (cf. UNEP, 2001).

Beside, for exchanging information (case studies, benchmarks, technology fact sheets, etc) related to CP, a number of seminars, round tables, meetings, and networks have been organised and set up widely. For instance, six International High Level Seminars on CP have been organized on a biennial basis by UNEP. Examples of networks that have been established in this field include the Greening of Industry Network (GIN), International Green Productivity Association (IGPA), World Cleaner Production Society (WCPS), CDG's Latin American Network, Canadian C2P2 network, O2 International Network of Sustainable Design and PREPARE for Europe (cf. UNEP, 2002).

In the development of CP oriented policies and strategies, a number of countries have made progress in applying a mix of instruments for promoting CP. While leading countries (for example USA, Denmark, Norway, Sweden, the Netherlands, Austria, Spain, and Australia) have paid attention to and a focus on CP related to products, services and consumption through developing an Integrated Product Policy (IPP) framework, an Environmental Product Policy (EPP) framework, or a Product-oriented environmental management system (POEMS), developing and in-transition countries, supported by international donors (as Asian Development Bank, World Bank), have placed their emphasis on establishing national CP strategy and policy, and promoting integrated CP approaches which mainly focus on production processes in companies (cf. UNEP 1994; UNEP 2002).

Given cleaner production achievements and experiences in practice, UNDP (2002) suggests that the progression of CP in a country should apply an interactive approach which follows both top-down and bottom-up approaches, illustrated in Figure 7.3.

This model, of course, will be adapted and deviated following the specific situation of each country. Most countries should thus adopt a combination of top-down and bottom-up approaches to help facilitate implementation of CP.

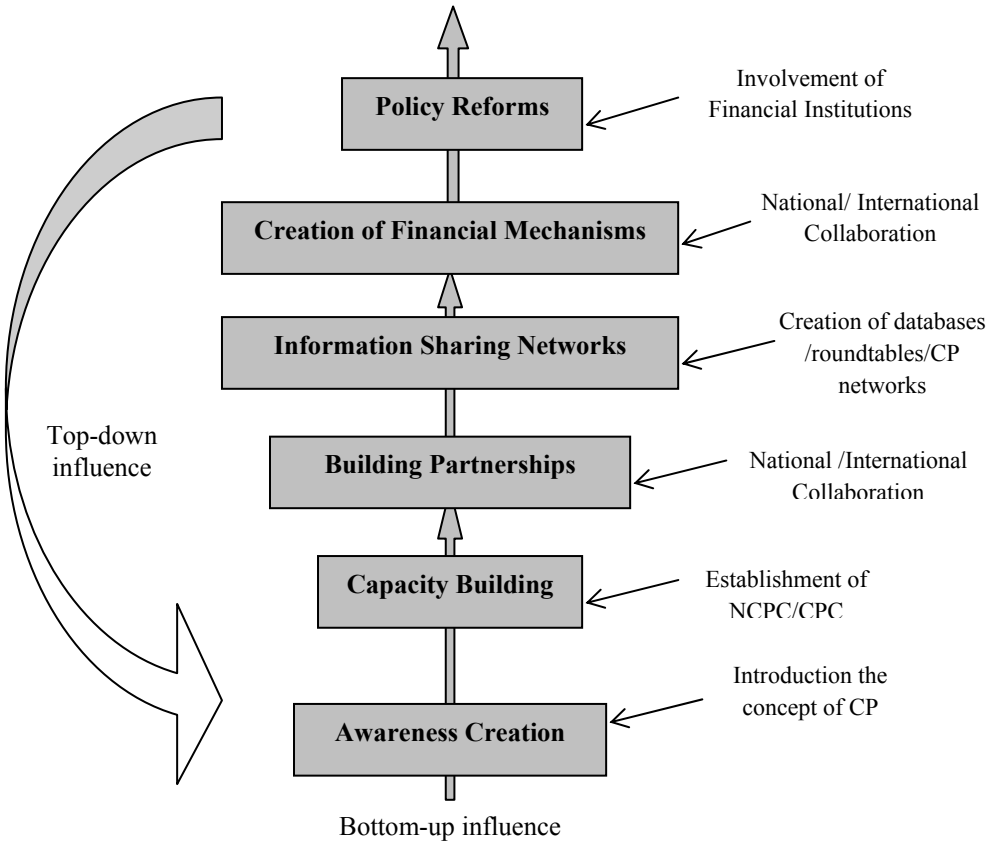

Figure 7.3 Typical progression of mainstreaming cleaner production
(Source: UNEP, 2002)

7.3 CLEANER PRODUCTION IN VIET NAM

In solving the conflicts between rapid industrial growth and severe environmental degradation and facing the troubles of costly end-of-pipe treatment approaches, the concept of cleaner production became more and more convincible. Combined with the international success stories the concept of CP has gained the attention of Vietnamese governmental authorities.

7.3.1 Establishing cleaner production - Related policy/strategies and institutions

In January 1994, the Law on Environmental Protection (LEP) laid down in chapter II, article 11:

> "*The State encourages, and shall create favourable conditions for, all organisations and individuals, the rational use and exploitation of components of the environment, the application of advanced technology and clean technology, the exhaustive use of wastes, the economic use of raw materials and utilization of renewable energy and biological products in scientific research, production and consumption".* And in chapter V, article 46: *"Viet Nam's Government gives priority to countries, international organizations and individuals in training, research in environmental field, application of clean technology, development and implementation of projects for environmental improvement, (...) in Viet Nam".*

In June 1998, the Politburo issued a directive (No.36-CT/TU) on "Promoting environmental protection in the period of national industrialization and modernization" in which its section 3: "Pollution and environmental risks prevention, environmental degradation remediation" encourages the "application of clean technologies that consume less materials and energy and generate less wastes". The directive embodies the application of the basic principles of Agenda 21 to the specific conditions of Viet Nam and emphasizes the significance of pollution prevention in Viet Nam's period of industrialization and modernization. These legislation documents form a firm legal basis for the application of cleaner production in Viet Nam.

At the national level, the Viet Nam Cleaner Production Centre (VNCPC) was established, in July 1998, as a joint initiative by the United Nations Industrial Development Organization (UNIDO) and the United Nations Environmental Programme (UNEP), and financed by Switzerland (with US$ 2.55 million). VNCPC is hosted by the Institute for Environmental Science and Technology (INEST) at the Hanoi University of Technology (HUT). The main goal of the VNCPC is to widely disseminate and promote the application and implementation of the CP approach in industrial activities, contributing to reducing industrial environmental pollution load in Viet Nam.[138]

In September 1999, the Government of Viet Nam listed cleaner production as one of its key strategies for sustainability by signing the International Declaration on Cleaner Production. Following the signing, VNCPC supported the MOSTE/National Environment Agency (NEA) in making cleaner production a main activity in the

[138] The mission of VNCPC is: (1) to train the human resource base in enterprises, industry associations, consulting companies, research institutes, academic institutions, and governmental industrial and environmental management agencies in CP methods; (2) to demonstrate CP Assessment in industries to show the advantages of the CP approach, and at the same time adapt the internationally developed CP approach to Vietnamese conditions; (3) to assist policy-makers and make recommendations on how to promote the concept of CP in industries and through legislation; (4) to promote the concept of CP and raise awareness among industries and governmental agencies; (5) to assist universities in integrating CP into their curricula; (6) to co-operate with domestic and international organisations with the aim of supporting the implementation of preventive environmental protection; and last, to serve as a focal point of the UNEP/UNIDO Network of National CPC (Source: VNCPC, 2003)

Environmental Strategy 2000-2010[139] and in drafting the National Cleaner Production Action Plan 2001-2005. The Action Plan, which includes eight programmes with 24 actions, was approved in May 2002 (!).

The establishment of VNCPC, the signing on the International Declaration on Cleaner Production, and the approval of the National Cleaner Production Action Plan are seen as starting points for the institutionalization of CP in Viet Nam.

Two National Cleaner Production Roundtables were organized (in 2002 and 2004) by the National Environment Agency in cooperation with VNCPC and international organisations (CIDA, UNEP, and Programme for Danish environmental assistance to Viet Nam). The participants were mainly CP consultants (service providers), and representatives of industries, governmental organizations, and national as well as international environmental experts.

According to Tran and Leuenberger (2003), in Viet Nam until 1998, CP initiatives have only been carried out at an exploratory level and in demonstration projects. The project "Studies on recovering and treating industrial wastes", performed under the National Research Programme on Environmental Protection from 1991 to 1995, can be considered as the first project oriented toward CP.[140] At the local level, after that period, many international donors (UNDP, UNIDO, ADB, WB and the government of countries as Canada, Sweden, Denmark, and Australia) have shown interest in supporting similar environmental projects in provinces and large cities such as Viet Tri, Thai Nguyen, Dong Nai and HCMC. Phung (2002) and Tran and Leuenberger (2003) recognise that the results of the mentioned projects prove that initial achievements were made, such as reduction of water, fuel and chemical usages and reduction of waste and emissions, with low cost measures. In other words, 'win-win' opportunities for Vietnamese industry exist: to reduce waste, to improve production efficiency, and to save money. Especially the CP adoption in HCMC is impressive and has been taken up more active than in other provinces (see also Part 7.3.4 in detail).

A number of pollution prevention and cleaner production projects that have been supported from the mid 1990s onward by international organizations and governments are presented in Table 7.1.

Table 7.1 Pollution prevention and CP projects in Viet Nam

No.	Project name	Funded by	Period
1	Viet Nam Cleaner Production Centre	Switzerland/UNIDO	1998-2003
2	Strategy and mechanism for promoting cleaner production in developing countries.	Norway/UNEP	2000-2003
3	Cleaner production project as part of environmental management project in the Thai Nguyen province	Denmark	2001-2002

[139] The National Strategy for Environmental Protection (NSEP) has three objectives: (1) to prevent and control pollution; (2) to protect, conserve and sustainably use natural resources and biodiversity; and (3) to improve environmental quality in urban, industrial and rural areas (NEA, 2002b).

[140] This project was carried out with foreign aid by the Center for Environmental Science and Technology of Ha Noi University of Technology in cooperation with the Institute of Chemistry of the National Center for Natural Science and Technology, and the Institute of Industrial Industry of the Ministry of Industry (cf. Tran and Leuenberger, 2003).

4	Cleaner production project as part of environmental management project in the Viet Tri province	Denmark	2002-2004
5	National strategy on pollution reduction and monitoring	Denmark	2000-2002
6	Pilot projects on industrial pollution prevention	WB	2000
7	Promoting policy and cleaner production application in some developing countries	ADB	1999-2000
8	Environmental projects Viet Nam-Canada (VCEP)	Canada	1996-1999
9	Viet Nam-Canada Environment Project, cleaner production component in enforcement of environmental laws	Canada	2001-2006
10	Cleaner production and waste management in medium and small-scale industries.	Canada	
11	Policy for protection the industrial environment	UNDP/UNIDO	1996
12	Reduction of industrial pollution in Viet Tri	UNDP/UNIDO	1996-1998
13	Reduction of industrial pollution in Dong Nai province	UNDP/UNIDO	1996-1998
14	Reduction of industrial pollution in Ho Chi Minh city	SIDA/UNIDO	1997-1999
15	Apply cleaner production in paper industry	SIDA/UNEP	1996-1997
16	Reduction of industrial waste from textile industry	CIDA-IDRC	1995-1996
17	Training on pollution prevention	SWEDECORP	1995
18	Transfer technology on wastewater treatment and implement pilot project on cleaner production	Australia	1998-2000

(Source: UNDP, 1999; Tran and Leuenberger, 2003)

7.3.2 Cleaner production activities

Under its mission, VNCPC has fulfilled CP demonstration projects as one of the main tools. The objectives of in-plant demonstration projects are to illustrate how the CP concept works in Viet Nam and to show the benefits of CP when it is implemented in industries in Viet Nam. The purposes of in-plant demonstration projects are to get good results from profitable CP options that have been implemented and sustained. The results are then disseminated through seminars, reports and on-site visits to the demonstration factories. The in-plant demonstration projects have also been used to provide hands-on training for the participants in the train-the-trainer programme[141] (cf. Hoang, 2001). From 1999 to 2003, there were 38 enterprises in five industrial sectors (textile-dyeing, paper-pulp, beverage, seafood processing and metal finishing), that participated in the CP demonstration programmes of VNCPC (cf. Ngo, 2004).

The economic and environmental benefits in companies participating in demonstration projects are the reduction of material consumption, water consumption, chemical consumption, energy consumption, fuel consumption, etc. as introduced in Table 7.2. According to Ngo (2004), the important factor that ensures the success of cleaner production performance in companies is their internal capacity. Thus, the

[141] VNCPC trained and certified 39 CP trainers in two years 1999 and 2000. Most of them now work either as CP consultants or in DOSTEs and other state agencies. In addition, 19 CP awareness-raising seminars for a total of more than 800 staffs from government agencies, research institutions, and industries have been organized (cf. Tran and Leuenberger, 2003). Up to the end of 2003, VNCCP organised 1,818 intensive-training courses and 42 seminars/workshop in 17 provinces and cities (source: VNCCP, available in http://www.un.org.vn/vncpc/cases/summation_of_the_project.htm).

priority of projects is to build the environmental capacity of enterprises, research institutes and consultants.

Table 7.2 Benefits from cleaner production adoption in three industrial sectors

Items	Pulp and Paper	Textile & Dyeing	Metal Finishing
Reduction in water consumption [%]	13-48	5-35	15-30
Reduction in material consumption [%]	2-15	NA	NA
Reduction in chemical consumption [%]	2-66	2-33	5-50
Reduction in fuel consumption [%]	5-20	6-52	2-15
Reduction in electric consumption [%]	3-30	3-57	5-60
Reduction of wastewater [%]	13-48	5-32	1-25
Reduction of COD in wastewater [%]	20-50	10-32	5-20
Reduction of TSS in wastewater [%]	20-50	15-33	5-10

(Source: Ngo, 2004)

The CP approach, especially including the benefits, has gradually attracted the attention of different industrial sectors in Viet Nam. The Ministry of Industry (MOI) through the project "Strategy and mechanism for promoting cleaner production in developing countries", supported by UNEP and NORAD, has organized seven training courses on CP adoption for industrial enterprises, financial experts, local officials in Ha Noi, Hai Phong, Quang Ninh, Viet Tri, Da Nang, Bien Hoa and HCMC. Under the encouragement and assistance of MOI, Viet Nam Industry Corporations (Viet Nam Textile and Garment Corporation, Pulp and Paper Corporation) have studied and experimented with a model of so-called 'cleaner production industrial zone' in the Pho Noi textile-garment industrial zone. Beside, there are around 200 industrial enterprises officially registered or participating in CP demonstration projects which are financed by international donors or via state budget. In practice, a number of enterprises that have adopted CP solutions are not included in this figure (cf. Nguyen, 2004).

The Ministry of Fisheries (through the project "Seafood Quality Improvement Programme" (SEAQIP), financed by the Government of Denmark, 2000-2005) has cooperated tightly with the VNCPC in the application of CP solutions into their businesses (cf. VNCPC, 2003). During 2000-2004, there were 21 seafood processing enterprises attending the project "environmental management and cleaner production performance". The supporting activities of SEAQIP include: six courses on awareness raising in environmental management and cleaner production concept with 1,000 participants; three courses on ISO 14001 with 100 participants; 13 training courses on CP adoption with 414 participants; seven courses on energy accounting with 190 participants, and eight courses on the construction and operation of wastewater treatment plants with 278 participants. In addition, four workshops for exchange of CP experiences were organised in 2002 and 2003 (cf. Le, 2004).

7.3.3 Overall policy evaluation

UNEP (1995) suggests that "in line with international developments, the Government of Viet Nam has fully recognized the need for most, if not all, of the comprehensive institutional, legal and economic changes needed to drastically improve protection of

the environment". Through the enactment of the mentioned legal documents and action plan, the Government of Viet Nam recognises the significance of pollution prevention policy and shows a high concern on environmental protection through a cleaner production approach. In other words, cleaner production is seen as a bridge to fill the gap between economic development and environmental protection. Nevertheless, in practice, the National Cleaner Production Action Plan seems to have difficulties to meet its goals in the expected period (2001-2005). The reason is analysed in following parts.

Generally speaking, cleaner production promotion in Viet Nam through in-plant demonstration projects is rather successful. The project "the Viet Nam Cleaner Production Centre (VNCPC)" supported by UNIDO, UNDP and Switzerland, has achieved high effectiveness. It is clear that the VNCPC plays an important role in the dissemination and promotion of the application and implementation of the CP approach in Vietnamese industry, as well as in the establishment of the CP policy and strategies in Viet Nam (more evaluation, see Part 7.4.3.2). Through the application of cleaner production, the industry has a strong potential to reduce environmental pollution and resource use while achieving substantial economic results (as described in part 7.3.2. and Tables 7.2, 7.3 and 7.4). However, the cleaner production adoption has not yet been applied widely beyond the demonstration projects. A number of researchers, officials and institutions (NEA, 2002; Phung, 2002; Klarer et al., 2003; Nguyen, 2003; Tran and Leuenberger, 2003;) have discussed obstacles to CP implementation under Vietnamese circumstances. Their suggestions on the obstacles are rather unified and can be summarized as follows: lack of awareness in companies on CP; lack of financial sources for CP investments (especially in SMEs); lack of information on concrete CP options; lack of human resources; incorrect fixation of natural resource prices providing a poor incentive for saving; poor enforcement of environmental regulations; lack of legislation for promotion and support; lack of willingness/support of the factory manager; and a burden of increasing production cost, which decreases competitiveness. The in-depth evaluation on advantages and constraints of cleaner production approach in Viet Nam (through HCMC's experiences) is introduced below.

7.4 CASE STUDY: CLEANER PRODUCTION IN HO CHI MINH CITY

7.4.1 Overview of the implementation of cleaner production approach in HCMC

In 1996, the first cleaner production project started implementation in HCMC, entitled "Industrial pollution abatement in Ho Chi Minh City" project TF/VIE/00/005, with financial and technical support from SIDA and UNIDO. It can be seen as the first project oriented toward CP in HCMC. The project aims to prevent pollution through resource savings, reduce consumption of material and energy, reduction of waste generation at source and strengthening of management efficiency, thus contributing to improving the environment and increasing companies' benefits. The project has been implemented in three phases. Phase 1 (1996) aimed to study environmental pollution in the City's industries. In this phase, experts of UNIDO and Viet Nam carried out a feasibility study on environmental pollution control from industries in HCMC in order to identify objectives and contents of the project. Phase 2 (from 1997 to 1999)

performed demonstration projects in three sectors: Pulp and Paper, Food Processing and Textiles and Dyeing. Two companies of each sector participated in the programme, with remarkable results: Increasing profit for the company, improvement of the environmental performance, and a clear positive effect on management and product quality for the company (see Table 7.3 and Table 7.4).

Table 7.3 Results of the CP demonstration project (phase 2) supported by UNIDO

No	Company	Benefit from CP
1	Thien Huong Food company (instant noodle) (State-owned enterprise)	Investment : VND 840 million (US$ 54,000) Saving of VND 8,960 million/year (US$ 578,000/year) Reduction by 68% of wastewater quantity, 30-35% reduction of organic load and considerable reduction of air pollution. Reduction of noodle crumbs from 9% down 3%. Increase 25% production capacity.
2	VISSAN company (food processing) (State-owned enterprise)	Investment : VND 140 million (US$ 9,030) Saving of VND 392 million/year (US$ 25,300/year) Reduction by 20% wastewater quantity, 33% reduction of organic pollution load, 27% reduction of solid waste and considerable reduction of air pollution.
3	Xuan Duc Paper company (State-owned Enterprise)	Investment: 20 million VND (US$ 1,300) Saving of 1,288 million VND/year (US$ 83,000/year) Reduction by 33% wastewater quantity, 20% reduction of organic pollution load, 30% reduction of air emission and 30% reduction of solid waste. Due to reduction ragged paper, production increases 5%
4	Linh Xuan Paper company (State-owned enterprise)	Investment: 700 million VND (US$ 45,000) Saving of 1,400 million VND/year (US$ 90,300/year) Reduction by 45% wastewater quantity, 35% reduction of organic pollution load, 20% reduction of air emission and 30% reduction of solid waste. Due to reduction ragged paper, production increases

5	Phuoc Long Textile company (State-owned enterprise)	Investment: 61 million VND (US$ 3,900) Saving of 565 million VND/year (US$ 36,500/year) Reduction by 26% wastewater quantity, significant reduction of emission and pollution load. Reduction of waste products
6	Thuan Tuan Textile-Dyeing (Private enterprise)	Investment : 1,400 million VND (US$ 90,300) Saving of 1,000 million VND/year (US$ 64,500/year) Reduction by 34% wastewater quantity, 30% reduction of organic pollution load, 70% reduction of air emission Reduction of reprocessing ratio and production increases 30%.

(Source: VCPC, http://www.un.org.vn/vncpc/ketqua/index.html)

Table 7.4 Financial impact of the measures implemented in the demonstration companies under the HCMC-CP Project (phase 2)

Financial Indicators	Food Processing Sector	Pulp and Paper Sector	Textiles and Dyeing Sector	Total
Number of implemented options	33	40	33	106
Investments (1,000 US$)	72	65	104.4	241.4
Net annual savings (1,000 US$)	661.7	196	115	972.7
Pay back period (months)	2	4	14	4

(Source: UNIDO, 1999)

Because of the remarkable results of the project, which were highly appreciated by international organizations and Vietnamese authorities, the donors (SIDA and UNIDO) decided to continue supporting DOSTE for the implementation of phase III of this project, from December-2002 to December-2004. Phase III aims to: (1) development of CP friendly policies; (2) assistance to companies in advanced aspects of CP such as the adoption of medium and high cost cleaner technologies (limited attention will be devoted to end-of-pipe technologies); (3) feasibility study to explore cost effective ways of disseminating CP; and (4) institutionalization and capacity-building of local institutions.

At the end of 2001 continuing in 2002, DOSTE also received a project, financially supported by the French Environment and Energy Management Agency (ADEME), giving them technical assistance by the Asian Institute of Technology (AIT). Three plastic and two seafood processing companies participated in this six months project (December 2001 - June 2002). Although it was a short-term project the participating companies showed substantial improvements in energy saving (up to 20-30% in plastic companies) and water saving (up to 30-40% in Agrex Saigon and District 8 enterprise). See Table 7.5.

Table 7.5 Results of the Cleaner Production project supported by ADEME and AIT

No	Company	Benefit from cleaner production
1	Sai Gon Plastic Company (state-owned enterprise)	Saving of 189,630 kWh electric power/year, VND 151.71 million/year (US$ 9,800/year)
2	Tan Dai Hung Plastic Company (private enterprise)	Saving of 873,029 kWh electric power/year, VND 698.42 million/year (US$ 45,060/year)
3	Vinh Tien Plastic Company (private enterprise)	Saving of 28,243 kWh electric power/year, VND 22.59 million/year (US$ 1,460/year)
4	Agrex Sai Gon (seafood processing) (state-owned enterprise)	Saving of 48,678 kWh electric power/year, 10,050 m^3 used-water/year, VND 107.7 million/year (US$ 6,950/year)
5	District 8's export product processing state-owned enterprise (seafood processing)	Saving of 26,723 kWh electric power/year, 96.55 million VND/year (US$ 6,230/year) Reduction by 28 % used-water quantity (~17,268 m^3/year), Reduction of CO_2 emission to 4.1 tons/year

(Source: Dao, 2002)

Additionally, in HCMC, other programmes and projects relating to cleaner production were implemented in cooperation with the Australian Environmental Agency, US-Asian Environmental Partnership (US-AEP).

To further promote and facilitate the implementation of cleaner production projects, in 1999, the City authority has established two environmental funds: "Industrial Pollution Abatement Fund" and "Revolving Fund" (see Box 7.1 in detail). These funds have certainly contributed to the resolvement of the financial constraint of enterprises when they are willing to perform environmental pollution control measures in their factories.

7.4.2 Evaluation of cleaner production approach in Ho Chi Minh City

As recorded above, CP has only been recently introduced to the authorities and industries in HCMC. Up until today, CP implementation in HCMC just happens through CP demonstration projects, which are almost all developed and financed by international organizations. Most of the CP-related activities performed by the City Departments aim to contribute to meeting the objectives of these projects. As such, in HCMC the CP approach seems to be rather ad hoc and piecemeal. Due to lack of expertise and lack of the commitment of City leadership, the HCMC authorities have not yet approved nor implemented their own comprehensive cleaner production strategy. Consequently, the overall objective of the City's cleaner production policy is still unarticulated, not unlike that of the EoP treatment policy. The lack of a clearly formulated policy objective makes the evaluation of the CP policy and approach of HCMC in terms of its effects and effectiveness impossible. We are only able to evaluate the various demonstration projects, which are strongly mediated by international human and financial resources. Such an intermediate evaluation of the implementation of current CP projects is nevertheless essential in order to learn and adjust the CP policy and approach of HCMC, and to contribute to an acceleration and institutionalization of this CP approach in the City's environmental policy in the future.

In this research, the intermediate evaluation of the CP projects is based on the results of on-site surveys in 19 (CP demonstration) enterprises, combined with in-depth interviews to three main groups: enterprise's managers, governmental officials, and CP consultants (see chapter 4). This evaluative study analyses two levels of intervention: individual CP demonstration projects and overall CP policies in HCMC. In doing so, first the advantages and constraints of the implementation of CP options at company level are assessed by analyzing four internal factors: in-company attitudes, company management, technological factors, and economic dimensions. In the subsequent second section, the current City CP approach will be assessed in qualitative terms by analyzing the relations between (CP demonstration) companies and the wider social environment. Through a network analysis the rules and resources in economic, policy and social networks around the companies engaged in cleaner production implementation will be assessed. The results of these evaluations help drawing conclusions and recommendations on the actualities, possibilities and constraints of further developing a City-wide cleaner production policy approach towards SMEs.

7.4.2.1 Evaluation of cleaner production: Internal practices

Attitudinal issues

The respondents from enterprises indicated that the main driving force to take part in the demonstration projects or to apply CP measures is the acknowledgement of CP benefits (95%). Besides, environmental pressure (53%) from surrounding residents and related authorities is a key drive for applying CP as well. Less important reasons are 'creating a positive public image' (32%), the requirement of a holding organization (26%), and receiving loan from the Industrial Pollution Abatement Fund (26%).[142] Differences in motivations for CP implementation between large-size enterprises and SMEs are presented in Table 7.6.

Table 7.6 Key drivers for cleaner production implementation

Reasons	N = 11 **Large-sized enterprises** (%)	N = 8 **SMEs** (%)
Acknowledgement of CP benefits	91	100
Facing environmental pressure	46	63
Create a positive public image	36	25
Receiving loan	27	25
Demanding from holding organization	18	13

Based on Table 7.6, it shows that large and small and medium-sized enterprises agree on the main reasons to implement CP, which is the acknowledgement of CP benefits. The only small differences are that SMEs face with external pressures more than large enterprises, while large enterprises seem to pay more attention to their public image than SMEs[143].

Along with attitudinal constraints that come from distinct characteristics of SMEs (such as a preoccupation on the short term, unwillingness to take risk, resistance against change) (cf. Danihelka, 2004; Hillary, 2004; Dasgupta, 2000; Frijns J., 2000; Visvanatha and Kumar, 1999), the survey also reveals other constraints. There is still a lack of incentives or encouragements for the employees who have to implement CP options. Only 37% out of the surveyed enterprises introduced a reward or incentive for implementing CP options. Besides, out of the surveyed enterprises only 42% trained their employees on CP solutions. Clarifying that the majority of employees were not involved in such in-plant CP projects.

According to consultants, when they contact enterprises to invite them to participate in the CP project, 73% of consultants got the enterprise's acceptance. However in the

[142] Compared to a similar survey of 33 SMEs in London area, conducted by Pimenova and van der Vorst (2004), the main driving forces for environmental action were ranked as following: social responsibility (68%), compliance with the existing legislation (31%), growing public awareness (27%), and financial benefits.

[143] The latter suggestion is similar to that conducted by Pimenova and van der Vorst (2004). It is interesting to know through the study of Hillary (2004), that improved image was the most important benefit for SMEs implementing EMAS. However this became more important as the size of the firm decreased, i.e. 38% of medium companies and 54% of small companies cited it as the first benefit from the adoption of EMAS.

first contact, 60% of the consultants faced a certain degree of unwillingness from enterprises due to fear of business information or technology know-how leakages (73%) or poor CP understanding (67%). In addition, the consultants (87%) suggested that other attitudinal constraint for the CP implementation is low awareness of employees. So far, only enterprises that attended in demonstration projects or pilot programmes understand CP concepts. Most of the others have not yet clearly conceived this approach. The consultants also recognized that due to enforcement pressure, some enterprises have had to prepare a CP investment document, which is just done to show to the environmental authorities. They really do not recognize CP as a benefit approach and have no plans to implement the planned investment.

Given these results, lack of knowledge and awareness of CP clearly hamper the introduction of environmental improvements.

Organizational issues

The survey shows that commitments from enterprise management often exist. In the CP implementation process, all enterprises have appointed staff to work and cooperate with consultants to identify pollution mitigating measures and implement CP options. The entrepreneurs recognize that through developing CP options, their employees learn a better working style, for instance, paying more attention to good house keeping. The survey shows that most of the CP implementing enterprises (95%) had prepared an environmental policy statement, which in general is motivating to continue to develop CP options in the enterprises. However, for most enterprises this environmental policy statement was not followed by concrete CP implementation. The organizational reasons behind this failure can be summarized as follows.

This failure has little to do with the allocation of resources, but more with organizational reasons. The survey indicates that most of the selected enterprises lack a special section on environment while 84% of them appointed an employee who is responsible for environmental issues. However, this staff in general had none environmental related backgrounds such as mechanics, food processing, chemical, medicine, biology, etc. Only one of them followed an environmental education. In most of the cases, one member of the top management participated in the CP team, being responsible for efficient management of material flows and using CP options as a method to achieve this. However, due to their 'multi-functional' responsibilities in SMEs such managers could not focus on environmental issues.[144] Concluding that lack of skilled and specialized personnel is a main reason for the failure.

In addition, all consultants complain that during CP advising at companies they have faced the following constraints: Unavailable or inaccurate data in each production section of enterprises (93%); inexistence of track record or documentation of the performing of CP options; lack of cooperation between the enterprise's sections as well as lack of the internal reporting, communication and training from top management level to lower levels in the companies. Given those constraints, the continuously CP implementation within such companies will not last in contrast with what is stated in their environmental policy statement.

[144] In line with that view, Hillary (2004) states "the more multifunctional the staff, as is common in micro and small companies, the more likely the process of implementation will be interrupted".

Technical issues

The survey indicates that CP solutions often selected are: good house-keeping (74%) and process modification (63%), while other less often selected solutions are material substitution (42%) and reuse (21%). When advising business, 73% of consultants frequently combine both cleaner production and end-of-pipe treatment approaches. It results in less cost for meeting environmental regulations. Technical constraints which the consultants faced when surveying enterprises are: lack of precise measuring instruments for better controlling manufacturing process or for measuring water, energy consumption (100% of the consultants agreed); absence of original equipment specifications (73%).

The survey reveals that there are internal technical shortcomings in companies: capacity of staff on technology is low, thus they mainly rely on consultants to evaluate and select CP solutions; product and its production process vary seasonally (especially to seafood processing) or depend on client's demand (interrupted or interruptible production process) causing trouble in monitoring and recording CP outputs.

In HCMC, due to the variety in production methods of SMEs, it is not easy to determine appropriate CP options or 'best practices' for each specific SME feature. CP adoption, which came from western technologies, is more effective in case of large scale enterprises. SMEs prefer 'good examples' from similar SMEs in the local neighborhood they are working in (Gärdström and Norrthon, 1994; Visvanatha and Kumar, 1999). In addition, Luken and Navratil (2004) state that for SME's circumstances technological changes are primarily with low complexity and small investments, so that most of the implemented changes are not spectacular.

Economic issues

The survey indicates that 68% of consultants recognized that the suggested CP options belong to medium-cost solutions[145]. The consultants suggest that payback periods for an efficient CP project should be one to two years, which is enough time for monitoring, for recognizing results of CP implementation and for changing the behaviors of employees and managers.

As introduced in part 7.4.2.1, most enterprises acknowledge the benefits of CP. When asked about other benefits gained besides environmental improvement, 'increasing profit' scores first in rank (79%)[146] together with 'better working environment'. Other benefits are 'improved image' (58%), 'improving product's quality' (53%), while the least celebrated benefit is 'increasing environmental awareness of employees' (5%). The majority of the consultants share the same conclusions: CP implementation increases the financial benefits for the company (80%) and improves its product quality (67%).

[145] Through personal discussions with CP consultants in HCMC, it is revealed that it is not defined clearly what is "low-". "medium-" or "high-cost solution". These terms depend on investment scale; payback period of CP solutions (low < 1 year, medium: 1-3 year, and high> 3 year), and technological complexity of CP solutions. However, a medium-cost solution is often implied at costs around 300-1,000 million VND and with payback time shorter than 3 years.

[146] There is a large difference when comparing this with results of Pimenova and van der Vorst (2004): 'financial benefits' only scores by 20% of the respondents. However, it is in line with the suggestion of UNEP: "More important than high environmental awareness, the need to increase efficiency is what drives these companies to implement CP programs" (Ashton et al, 2002)

At the same time, it is clear that economic constraints are seen as a main obstacle to implement CP options in SMEs (Hillary, 2004; Pimenova and van der Vorst, 2004; Thiruchelvam et al, 2002; Frijns, 2000; Frijns and van Vliet, 1999; Visvanatha and Kumar, 1999). According to consultants, the ratio of developed options over total of proposed ones is 30-50%.[147] Those options with low investment cost and short payback periods of six months to one year are most popular in implementation (87%). Other options that require high investment will often not be developed due to lack of investment capital (73%), fear of affecting existing production process (40%), lack of man power (27%) and unavailable spare parts (7%).

Remark

Based on the results of the CP demonstration projects (see Table 7.3 and Table 7.4) and the internal analysis, it is clear that each individual CP project gains a remarkable effectiveness. By meeting environmental regulation through the reduction of wastewater discharges, solid waste generation and air emissions as well as cost savings due to substantial conservation of materials, water and energy, the implementation of such CP projects meet the needs of enterprises in both economic and environmental aspects *(relevance)*, and thus motivate CP adoption in HCMC, which had been the objective of these demonstration projects *(effectiveness)*. However, given internal barriers in CP implementation, it shows that the effectiveness of the CP projects is not as desired. Lack of knowledge and awareness on CP, low level of management, lack of the involvement of employees, lack of investment capital, etc, hamper the progress of CP adoption by SMEs in HCMC, especially after the demonstration projects have ended.

Important factors (decreasing from 1 to 10) for a successful CP project, based on the evaluation of managers of large enterprises and SMEs, are presented in Table 7.7.

Table 7.7 Important factors for a successful CP project

Important factors for a successful CP project	N = 11 **Large enterprises**	N = 8 **SMEs**
Awareness and commitment of management	1	1
Qualified specialists	2	3
Close cooperation with authority	7	5
CP training for the enterprise	3	7
Supporting policy for getting loan	5	4
Supporting capital	4	2
Strict enforcement and supervision for environmental law compliance	6	8
Dissemination channel of CP results	9	10
Appropriate project duration	8	6
Cooperation with mass media	10	9

[147] According to VNCPC's estimations, in average only about 40% of the total number of suggested options during the in-plant assessments is being implemented (cf. Klarer et al., 2003).

Based on Table 7.7, it shows that 'awareness and commitment of management' as crucial factor for CP implementation has the highest consensus between large enterprises and SMEs. In addition, it received most appreciation of officials and consultants. Both categories of enterprises see 'qualified specialists' as a crucial requirement too. There are different evaluations between large enterprises and SMEs on the role of supported capital, CP training and the project duration. The differences could be understood by the enterprise characteristics: SMEs give more concerns to financial issues and short-term investments ('supporting capital', 'project duration') and to surrounding relationship ('close cooperation with authority') than large enterprises. While large enterprises have more interests in the scope of a problem and how to solve it ('CP training for enterprise', 'strict enforcement').

7.4.2.2 Evaluation of cleaner production: Network analysis

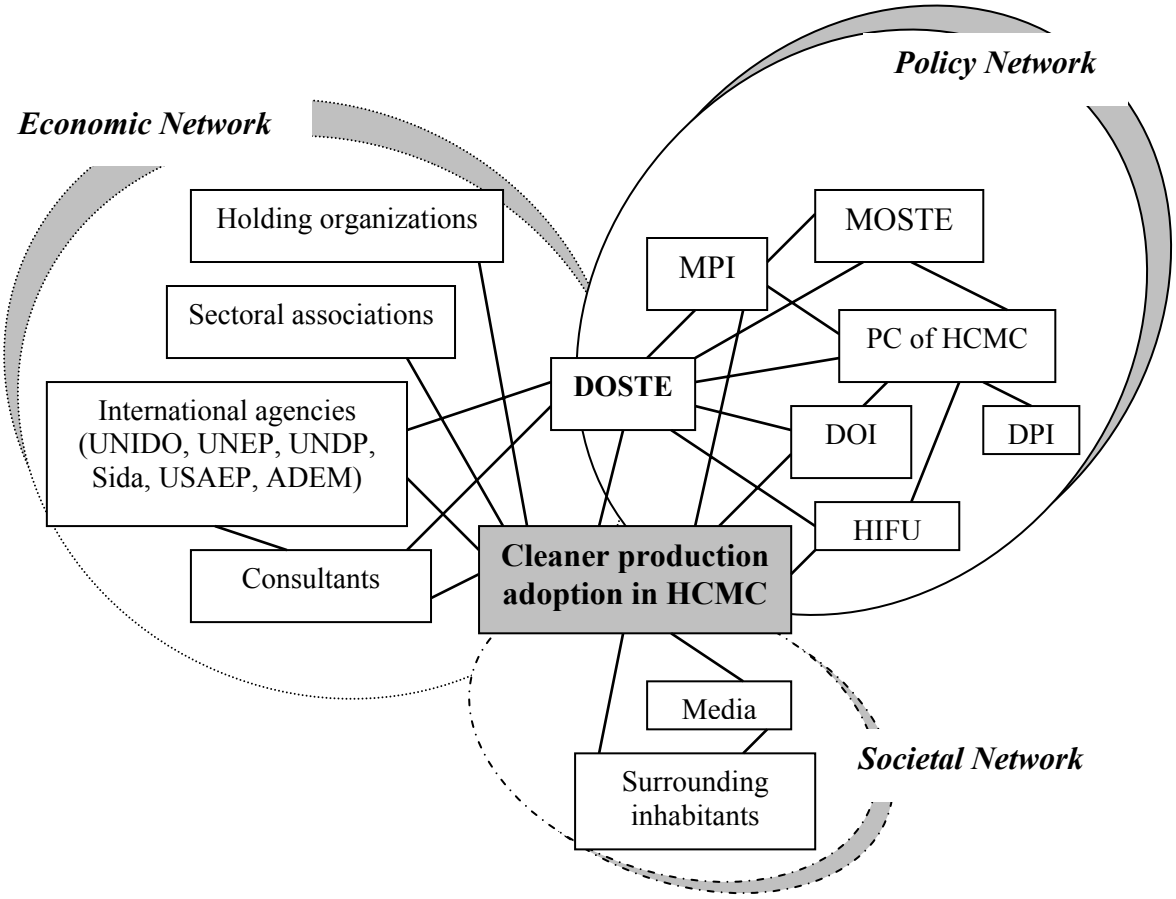

Figure 7.4 Triad networks in cleaner production adoption in HCMC

SMEs are largely dependent on a variety of stakeholders in their decisions to perform environmental activities and adopt cleaner technologies (Hillary, 2004; Frijns and van Vliet, 1999; Visvanatha and Kumar, 1999; Verheul, 1998). The study sought to identify which stakeholders influence SME behavior in the adoption of formal CP (Figure 7.4).

The role of main actors, the interactions between them and the institutional constraints are analyzed for the three networks.

Policy Network

As described in Part 6.3.2.3, a number of scholars suggest that local governments could be the most important channels for influencing the adoption of CP in new investments. Thus, the study analyses the CP related role of three main City authorities: the Department of Science, Technology and Environment (DOSTE), HCMC Investment Fund for Urban Development (HIFU) and the Department of Industry (DOI).

In CP implementation in HCMC, the important role of DOSTE is evident. As a key counterpart in the various international demonstration projects (see part 7.4.1), since 1996, DOSTE (in cooperating with foreign and local experts) performed a variety of activities to promote CP implementation in HCMC.

DOSTE implemented the Industrial Pollution Survey Programme with the main objectives of surveying, and investigating all industrial production activities in order to identify pollution levels in each unit, and classify the sectors that cause pollution. One of the main outcomes of the programme was to disclose a "black list" of 87 enterprises. Consequently, a City industrial pollution abatement programme was prepared and performed. Six in-plant demonstrations were conducted. After that, three sector specific booklets with two case studies each, were printed in 3,000 copies in Vietnamese and 1,000 copies of a booklet compiling all six case studied were printed in English. To introduce CP concepts and methodology to industry, three sector specific workshops were organized with the participation of 150 industry managers and a high-level meeting with 120 decision-makers from HCMC. Seven consultants and two officials from DOSTE were trained (in cooperation with the VNCCP), and then supplied CP knowledge and options to industry. Awareness raising seminars for a total of 782 participants on CP, end-of-pipe treatment technologies and environmental law and regulations were conducted. Other public awareness activities on CP concepts were developed through leaflets, television broadcasts, and newspapers on CP.[148]

A remarkable consequence of the CP projects was their impacts on the policy level. The City authorities gradually paid more attention to integrate CP as a complementary approach into City's pollution control strategies. With assistance from UNIDO's project, DOSTE prepared a strategy for promoting cleaner production in HCMC.

As known, DOI is responsible for industrial management of the enterprises of HCMC. In theory, DOI co-operates with DOSTE and sector associations to contact and persuade enterprises, and then DOI receives feedback and a response from the enterprises about the implementation of the CP programme. However, in practice, due to lack of manpower and expertise, the contribution of DOI in CP implementation in HCMC is minimal. As described before (in Part 7.3.2), the Ministry of Industry (MOI), as a counterpart of the project "Strategy and mechanism for promoting cleaner production in developing countries", has worked rather actively in CP adoption. MOI organized a number of training courses on CP adoption in some cities and provinces, including HCMC. However, the CP implementation of MOI as well as of Viet Nam Industry Corporations seems neither to affect nor to encourage that of DOI. One reason is that the CP implementations of MOI and its Corporations are mainly

[148] Source: DOSTE and UNIDO.

concentrated in central state-owned enterprises (SOEs)[149] that DOI does not manage directly.

In order to promote wider application of pollution control and CP options by enterprises, the People's Committee of HCMC has established financial incentives (including an Industrial Pollution Abatement Fund and a Revolving Fund, see Box 7.1).

The Industrial Pollution Abatement Fund has been managed by the Management Council of the Industrial Abatement Pollution Programme. Its members consist of representatives from DOSTE (standing member), HIFU, DPI, DOI, and DOF. The Managing Council is assisted by an Appraisal Unit. The Revolving Fund has been managed by the Steering Committee of Environmental Improvement Project. Its members consist of representatives from Project Implementing Unit (PIU), DOSTE - Project Management Unit (PMU), HIFU, and DPI.

In financial issues, HIFU is responsible for fulfilling the function of trusteeship for disbursement, debt collection management and providing a part of the counterpart fund to the Revolving Fund (see Box 7.1). HIFU participates in monitoring the project implementation process in line with an approved investment report to ensure the efficiency of invested capital. In addition, HIFU's staff joins a consultant group that includes DONRE's staff and other CP consultants acting as a bridge between enterprises and relevant state management agencies as well as providing some services including financial accounting and evaluating the enterprise's financial capacity. This 'extra job' of HIFU is appreciated because at present CP consultants in HCMC are lacking the needed financial accounting expertise. The relationship between HIFU and DOSTE in CP implementation is tight and contributes to the success of CP programme.

[149] In HCMC, there are 217 SOEs with the total capital of VND 63,183,156, out of which 106 (48.85%) are under the direct management of central governmental organizations with the capital of VND 48,312,170 (source: Statistic Office, 2004).

Box 7.1 Financial incentives for environmental pollution improvement in HCMC

● ***Industrial pollution abatement Fund***

The Industrial pollution abatement fund belongs to the Industrial Pollution Abatement Programme, established in accordance with the Decision No. 5289/QD-UB-KT dated 14 September 1999 by the PC of HCMC. Its beginning capital was US$ one million from the City's budget. The Fund aims to support the industrial pollution abatement projects in HCMC, in line with goals and objectives of the Industrial Pollution Abatement Programme in HCM city. The project owners are enterprises from all economic sectors.

Lending conditions: Loan period is 3 years, with 1 year grace period, interest rate of 0% and management fee of 0.84% a year; state-owned enterprises do not have to provide collateral (as a security pledged for the repayment of a loan) and are allowed to apply limited bidding rule (only limited number of contractors in bidding); non-state enterprises are not subject to bidding but have to provide collateral. The value of asset to guarantee for a loan is formed on the loan, accounting for at least 30% of the total loan and the other 50% must be housing, workshops and cars/trucks reported as collateral.

Appraisal and disbursement procedures: For a loan of less than VND 100 millions, the enterprise shall submit a loan request. The Appraisal Unit appraises and submits it to the Chairman of Management Council for approval. Disbursement is made only once; for a loan from VND 100 million to VND 1 billion, the enterprises have to prepare the investment project proposal for the loan. Then the Appraisal Unit appraises and submits it to the Chairman of Management Council for approval. Disbursements are made in line with construction progress. For a loan of more than VND 1 billion, the enterprises have to prepare an investment project proposal for the loan. Then the Appraisal Unit appraises and submits it to the Management Council for approval and the Chairman of People's Committee signs the loan decision. Disbursements are made in line with construction progress.

● ***Revolving Fund***

The Revolving Fund is part of the sub-project on "Industrial pollution control and institutional capacity strengthening" of the Project on "Improving environment in HCM City" established in accordance with the Decision No. 1339/QD-UB on 07/3/2001 by the PC of HCMC and the credit agreement signed on 21/12/1999 between Vietnamese Government and ADB. The fund's source consists of: A loan equivalent to US$ 2.5 million funded by ADB at the interest rate of 2% per year for the period of 15 years with a grace period of 6 years. The counterpart fund of the HCMC Investment Fund for Urban Development (HIFU) is accounting for 15% of loan for each investment project.

The Fund focuses on the industrial pollution abatement projects implemented in Districts 2, 9, and Thu Duc, which are in line with the objectives of HCMC Environmental Improvement Project. The project owners are enterprises from all domestic economic sectors.

Lending conditions: Enterprises located in Thu Duc District; Total property of borrower shall be at least 5 times higher than the loan value; lending limit: Each project shall be provided with a loan of maximum US$300,000. If a loan request is bigger than this limit, then the excess amount could be covered from other credit organizations at commercial interest rate; financial contribution: The enterprise's own capital (15%); ADB (70%); Investment Fund (15%); loan period: 3-5 years with the first year of grace period; interest rate of 4% a year and fixed for the whole loan period. Project preparation and appraisal are in line with Government's regulations.

Up to March 2005, the Industrial pollution abatement Fund has approved 43 investment projects with VND 28.7 billion (US$ 1.82 million) of total investment cost and VND 11.4 billion (US$ 723,000) of total disbursements while the Revolving Fund has approved for loan three projects, with VND 15 billion (US$ 950,000) of total approved loan and VND 1.45 billion (US$ 92,000) of total disbursements.

(Source: Reports from DONRE and HIFU)

The role and responsibilities of City authorities were also evaluated through interviews and surveys. It revealed that according to officials (75% out of eight interviewers, listed in Appendix 6), stated-owned enterprises (SOEs) are often preferred more than private ones in loan assistance policy, in which preferences mentioned are collateral security (88%), payback period (12.5%) and lending procedure (12.5%). However, one interviewee stated that there is no discrimination between them. According to the officials, constraint in loaning implementation comes from enterprises (57% of officials agreed), from disbursement agencies (28%) and from appraisal agencies (14%). When caused by enterprise, reasons mentioned are not having experiences in preparing a loan document (77% of officials agreed); lack of required documents (44%); and requesting a big loan (22%).

The interviewed officials indicate several institutional constraints: (1) The integration of CP approach in sectoral development strategy and policy is far from desirable; (2) inexistence of a policy to enforce or encourage the enterprises for applying CP; now CP implementation is mainly voluntary or comes from the demand of holding organization; (3) absence of a green domestic market to motivate CP adoption in enterprises; (4) governmental policy is inconsistent. For instance, at the macro level, MOSTE and NEA themselves could not perform all eight programmes with 24 actions of the National Cleaner Production Action Plan. Just one of the actions, Action 23 "Encourage different sectors to develop cleaner production programmes" needs to develop suitable policies and mechanisms to promote the process of applying CP in different sectors. Without coordination between ministries (MOSTE, MOF, MOI, MPI), the action plan's objectives cannot be achieved. However, such coordination requires high level interventions. So far, there are neither well-established procedures nor mechanisms to assure that this effort will be undertaken. UNEP (1995) states that overall coordination of activities and inputs from the government administrative agencies (of Viet Nam) remains a challenge. For example, the National Cleaner Production Action Plan was approved in 2002, out of which Action 22 is defined as "encouraging localities to develop a cleaner production programme". Due to lack of concrete encouragement from the central government, so far, only Khanh Hoa province (2003)[150] and HCMC (2003)[151] have had their own Cleaner Production Action Plan.

The survey indicates that HCMC authority and industry expect CP to be a promising approach that could bring both environmental improvements as well as economic benefits. In reality CP practices are not spreading as widely and rapidly as hoped. The role of the city and central authorities should be more active to improve CP adoption, as outlined in the following suggestions.

The awareness and commitment of the top management of the enterprises are considered as the most important factor to guarantee the success of CP adoption (see Table 7.7). Different-level authorities thus need to identify a reasonable strategy for motivating this aspect. Evans and Stevenson (2001) suggested that for convincing decision-makers, one must change the conditions in which they make their decisions,

[150] VNCPC supported Khanh Hoa's DONRE to establish a provincial cleaner production action plan. The plan was approved and is now under implementation (source: VNCPC, 2003).
[151] In cooperation between DONRE and UNIDO's experts and experts from the Strategy Research Institute under MOST, a CP policy and action plan in HCMC was finalized in December 2003 and has been submitted to the People's Committee for approval (source: Nguyen, 2004).

including the rewards and penalties they are confronted with from government, the technical and managerial resources available to them, and the pressures that may be exerted on them by civil society.

Given the lack of knowledge or awareness from enterprises as a barrier in CP implementing, the promotion of enterprise's awareness raising and even of curriculum development in university[152] may compensate this deficiency. Beside, authority should pay attention that CP must be recognized and promoted as a behavior, not a technical solution, and as voluntary not obligatory (Evans and Hamner, 2003). Thus, the promotion should aim at incentives as competitive advantage, revenue gaining, risk reduction, good management and public image enhancement. The authority and/or sectoral associations may establish a public reward mechanism to a good CP performance.

In conclusion on the role of authorities: "national policy is needed to create the system conditions that enable CP, but it is local policy and governance that ensure implementation" (Evans and Hamner, 2003). HCMC has much more advantages than other cities and provinces in Viet Nam in receiving international assistances, such as the mentioned CP demonstration projects. Through the implementation of such international projects, the HCMC implementing agencies have enhanced their governance capacity. The crucial role of environmental authority as DOSTE has in CP adoption in HCMC could not be denied. However, DOSTE (now DONRE) needs to cooperate more closely with other institutions at both national level (NEA, MPI, MOI, VNCPC) as well as city level (PC, HIFU, DOI, DPI) in order to follow up initial successes of CP adoption. It is priority now that DONRE persuades the People's Committee to approve the City cleaner production policy and action plan soon. This approval is the legal basic to enforce and encourage industries as well as actors in policy network in HCMC to implement CP options. And last but not least, for sustaining a strong network, DONRE as the representative of City authorities should continue to keep in touch with existing donors and to seek cooperation with other donor programmes.

Economic Network

- ***The role of consultants***

So far in HCMC consultants have had different levels of experiences in the CP projects. 47% out of 15 interviewed consultants (in Appendix 6) participated in two CP projects, 27% of them did four and 13% five CP projects. There is one consultant who has done 20 CP-related projects. Local consultants stated that, through the CP projects, they could gain experiences from foreign experts (67%), earn more income (60%), and expand their relationships (53%).

[152] In line with this suggestion, VNCPC organized two four-day training workshops for 43 lecturers of 13 Universities through-out the country. Viet Nam already has 5 universities that have designed and included Cleaner Production into their Bachelor and Master Degree training programs. Courses in Cleaner Production are counted as 2-3 credits. These universities are, in the North: Ha Noi University of Technology, Civil Engineering University, Hai Phong Private University, in the South: University of Technology of Ho Chi Minh City, Van Lang University (source: VNCPC, 2002). Also according to VNCPC (2002), in many universities, projects have been developed to help students in practising cleaner production methodology in industries. Favourable conditions have been created for students to accomplish their master's thesis in cleaner production topics.

According to the responses from enterprises, the role of the consultants in CP implementation is very important. In information distribution to enterprise, consultants are believed to be the most important (53%), while other sources are DOSTE (26%), media (16%) and other companies (16%). The role of consultants in CP projects often focuses on technological consulting (93%); 13% of consultants act as project coordinators; other tasks (33%) include assisting foreign technological experts, training, and project secretary. When in the survey was being asked about which group of consultants will be invited if the company implement CP themselves, 47% of enterprises chose consultants who are introduced by DOSTE to be more secure. 32% of them will invite independent consultants[153] or from universities or research institutes, and 11% of them would select themselves. Regarding the quality of consultants in a scale from very good to adequate, 47% of the hired consultants were ranked 'good' , 26 % 'very good' and 11 % 'adequate'. 16% of the respondents did not answer this question.

According to government officials, local consultants have deficiencies. (1) In HCMC consultants are sometimes not available to meet simultaneously a number of CP-consulted requirements of companies. At the same time, some enterprises have to invite consultants who come from VNCPC[154] in Ha Noi; (2) it is not easy to look for consultants with large expertise in several specific sectors, for instance electro plating; (3) local consultants often lack experiences in team work, which is highly appreciated by international experts; (4) some of them lack experiences working in project funding by international organizations, or in other words they can not satisfy the strict requirements, such as working time, adequate quality in assessment, discipline, etc. of experienced donors (UNIDO, UNDP). Consequently their contract may not be extended; (5) foreign language (mostly English) is sometimes a barrier in communication with foreign experts (faced by 20% of consultants); and, (6) as mentioned elsewhere, due to lack of accounting consultants, enterprises meet difficulties in the cost-benefit analyses of CP options. According to responses from government officials, characteristics of consultants such as high discipline and responsibility (37.5%), experience to foreign projects (25%), good foreign language skills (25%) are rather highly appreciated.

VNCPC, as one partner in the demonstration projects, is quickly emerging as a Centre of excellence for the promotion of CP in Viet Nam and has contributed significantly in CP activities in HCMC in past years. Based on VNCPC's annual reports and the evaluation report of Klarer, Tran and Marchich (2003), it is clear that so far overall the services (such as awareness raising, training, technical assistance, dissemination of technical information, assistance in obtaining CP investments, and policy advice) developed and provided by the VNCPC have been of good quality. VNCPC has thus a high credibility in industry. Through cooperation with various donors (DANIDA, CIDA, SIDA), VNCPC has gained significant institutional weight and expertise too. Given that, VNCPC can be seen as a long term partner for companies and policy makers. In addition, networking of VNCPC is substantial. VNCPC has managed to create a wide and well functioning network, including company networks, a network with relevant authorities (MONRE, NEA, MOST, MOI, MPI, Vietnam Chamber of Commerce and Industry- VCCI, DONREs, etc), a network with relevant universities,

[153] Independent consultants who have CP expertise work for neither university nor research institute.
[154] In an evaluation, Klarer, Tran and Marchich (2003) stated optimistly that CP demand could increase substantially in the mid term.

a network with key donor institutions (DANIDA, SIDA, CIDA, UNIDO, and the Swiss Reference Centre), as well as a network with other National Cleaner Production Centers (NCPCs).

However, several shortcomings of VNCPC's activities are recognised. First, at company level, CP implementation via VNCPC consulting is typically limited to no- or low costs options of good house keeping or process change, while best options and assessments have not yet been implemented. Consequently the effectiveness of CP implementation is not high. Second, due to lack of financial services, CP service packages that are supplied by VNCPC to industry are still not complete. Thus VNVPC has not really persuaded the enterpripre's involvement, especially with SMEs that lack ability to access a financial funding source. Third, the national capacity in CP still needs expansion. The Centre's staff and other trainees, while well trained in concepts and methodology, need more practical experience in in-plant assessments. Fourth, the access of VNCPC to the promising CP market of Southern provinces, where demand may develop (more) dynamically than in the Northern part of the country, is underdeveloped. This is a big constraint of VNCPC (cf. Klarer et al., 2003). And, finally, there is a lack of financial mechanisms (e.g. a set of service fees for consulting, training, assessment without donor funding) to support and sustain VNCPC's activities.

In the future, beside these usual activities, VNCCP should aim to facilitate behavioural change of entrepreneurs, policy makers and community leaders, who can create demand for CP improvement. This would enable the implementation of options (not just the production of options), and continuously supports SMEs to adopt CP.

Although the relationship between DOSTE in HCMC and VNCPC is tight, there is a clear need for a local assistance organization in HCMC which can provide technical resources needed to find CP solutions and prepare financing proposals. Then, governmental contacts with local enterprises could be built and maintained more easily. Due to the long distance and lack of expertise, VNCPC cannot supply immediately services that meet requirements from HCMC enterprises. Keeping in mind that CP can only be sustained in the City or surrounding region if the capacity is in place for its adoption (cf. Smidth, 2001), the City government has considered the establishment of its own CP centre. Lack of experts and unclear objectives has hampered the implementation of this idea. Another major constraint is the institutional affiliation and ownership of such a centre. Either it belongs to DONRE that hosts HEPA with an environmental service function, or to Department of Science and Technology (DOST), which houses the Energy Conservation Center.

- ***The role of international organizations***

As presented in Part 7.3.1, Viet Nam has received over 20 international projects on CP since 1996 that covered different sectors on different scales. It must be recognized that the role of international agencies (as donors) in promoting CP in Viet Nam has been very important. Given these projects (see Table 7.1), donor activities can be classified into three areas. Firstly, they influence national policy and environmental authorities (central and local levels) to encourage carrying out CP options in industry. Secondly, they raise awareness and build capacity through demonstration projects, case studies, training, technology transfer and information exchange on CP. And,

thirdly they help to overcome specific constraints emerging in CP implementing, such as financial problems to initiate CP measures.

Good results of international projects are for instance the establishment of the VNCPC that is responsible for disseminating and promoting the application and implementation of the CP approach in industrial activities and developing successful CP programmes in HCMC. Foreign assistance has also enhanced and improved the institutional and management capacity of DOSTE and other organizations. Through projects and activities, CP concepts and options are more and more familiar to authorities, industry and society in Viet Nam.

However, what will happen when this international assistance in CP dismisses or is over. Too what extent has CP been institutionalized in Viet Nam? It is clear that CP implementation in demonstration projects could hardly survive without foreign assistance.[155] To avoid too much dependence on external aid the government needs to ensure its own financial sustainability through allocation of national resources. With respect to SMEs' inability to raise money for necessary investments in CP, attention should be given to mechanisms that help financing CP investments. Financial support policy (low interest loan, tax exemption, 'loan guarantee'[156]), promotion of lending by local financial institutions, and assistance in procedures should be established. In short term, the procedures for approval, disbursement, and collateral should be simplified.

- ***The role of sectoral associations***

Due to the fact that they speak the same language, SMEs are more likely to trust sectoral associations for general information and support (Ashton et al, 2002). The survey reveals that a majority of interviewed enterprises have participated in sectoral associations (74%), for instance those on Paper, Food and Foodstuff, Plastic, Sea products, and Garment and Textile, the Youth Business, the District Business Club, etc. The survey indicates that these associations assist enterprises on technology (26%) and markets (21%). However, there are enterprises (16%) which did not receive any support from these associations. So far, sectoral associations do not provide information and support to prevent pollution in HCMC. Sectoral associations have not yet developed a role in transfer of CP options to their members, although they could act as an 'entering port', a 'good starting point' or 'gatekeepers' for providing information on environmental issues and encourage environmental improvement in their enterprises (Bruijn and Lulofs, 2000; Hobbs, 2000; Frijns and van Vliet, 1999; Mol, 1995).

Societal Network

In recent years in HCMC and Viet Nam, 'hot' news related to environmental pollution events such as oil spills, chemical leakages, polluted rivers, contaminated drinking water, or environmental complaints from citizens, more and more appears in

[155] In line with this suggestion, Mitchell (2003) states that dependence on outside assistance is a root cause for some of the problems associated with awareness and effective implementation of CP concepts in Viet Nam. And she recognized that many companies will not implement CP projects unless they are funded by an international organization.

[156] 'Loan guarantee' is a CP financing mechanism suggested by ADB. It overcomes the basic constraint to debt financing caused by lack of collateral in SMEs. To apply this mechanism, it needs a closed collaboration between local governments, local CP assistance organization and local bank (cf. Evans and Hamner, 2003).

newspaper columns. In fact, there are several CP popularizations in media both at central and local levels. In 2002-2003, VNCPC in cooperation with the Viet Nam Television (VTV) showed a 30-minute programme "Introduction to cleaner production" and another two 30-minute programmes "cleaner production in textile" and "cleaner production in pulp and paper" on National Television several times. The Voice of Viet Nam also broadcasted a 20-minute news programme and a 30-minute on-line forum about the application of cleaner production. Numerous articles were published in newspapers in Ha Noi (cf. VNCPC, 2002 and 2003). In HCMC, within the framework of the financial support from UNIDO's CP project, DOSTE in cooperation with HCMC Television (HTV) produced a video related to CP implementation in HCMC and broadcasted it on HTV several times.

Such media activities, it is a possibility to increase social attention, changes authority's behavior and contributes partly to raising environmental public awareness[157]. Unfortunately, information related to CP concept or eco-efficiency is still far from daily news on media.

7.5 CONCLUSIONS

The CP demonstration projects in HCMC have been successful in achieving the objective of enhancing the institutional and research capacities for CP within industry, government and universities. These projects are useful in revealing obstacles to progress both within the companies and in the relationship between companies and the outside world. Furthermore, these projects show that it is possible to organize an external CP consulting group, which functions as a catalyst for SMEs. However, the adoption of CP has not yet been applied widely in HCMC beyond the demonstration projects, and this chapter has analyzed the various constraints which explain that.

This study - and various other international experiences - reveals that CP can be a promising approach, both for economic efficiency and environmental effectiveness reasons, and for public authorities as well as private business in HCMC. The conclusion is justified that CP should become an integral part of environmental policies towards SMEs in HCMC. However, it must be recognized that the majority of implemented CP demonstration projects in SMEs focus on good house-keeping measures. Most of the advanced and/or high-cost CP options are hardly ever found in SMEs in HCMC, due to the specific circumstances. Besides attitudinal, organizational and technical constraints, financing problems are recognized as a mayor constraint for implementation of CP measures in SMEs. The most promising incentives for CP adoption in SMEs relate to the awareness and commitment of the top management of these enterprises. The general conclusion should be that, in spite of some progress in promoting the CP approach among SMEs and other enterprises, the CP application in SMEs in HCMC is developing far from easily and smooth, which is similar to Hobbs' (2000) statement: "only the surface of the potential has been scratched".

Under these circumstances, authorities should aim to assist SMEs in taking away the constraints in their pursuit of cleaner production, and at the same time set conditions that push SMEs towards CP options. Central and City governments can do this by formulating, financing and coordinating CP policies, projects and

[157] cf Frijn, Phung and Mol, 2000; O'Rourke, 2002; Le and Tran, 2003; Phung and Mol, 2004; Mol, 2005.

facilities. DONRE as well as other authorities such as DOI, HIFU (with assistance of international or/and local CP consultants) can give practical advices or technical help, and financial incentives to SMEs regarding preventative measures, next to their traditional control and enforcement duty. The possibility to establish strategies that combine realistic CP options and end-of-pipe solutions should be explored to ensure the program's ability to respond to the current needs of SMEs. Such a strategy framework must not only involve administrative measures as the enforcement of laws, guidelines and licensing, but also economic instruments such as a duty and tax system for waste disposal, a realistic pricing system for raw materials and energy, as well as a simple and easily accessible loan mechanism for financial supporting CP implementation.

Beside the crucial role of international organizations, this study illustrated the important position of local authorities in CP adoption. The more they operate actively towards SMEs the more a CP approach is implemented successfully. In addition, the model of cooperation among state authorities, enterprises and consultants in environmental improvement and pollution control is more and more preferred. The CP approach has introduced a new mode of environmental governance in HCMC, one operating via negotiation, consultation and cooperation rather than via regulation and enforcement. This interactive approach aims at motivating, involving and obtaining commitment from top management. Although it would need further study and experiments, such a change in industrial pollution control governance of the City government seems to be accepted naturally by various stakeholders without too many discussions on its relevance and effectiveness. The question remains of course, whether this new governance model is related to or can be held responsible for the poor results in institutionalizing CP policies beyond the demonstration projects. Evidences from other countries suggest that a more conventional top-down control and enforcement policy would not have done better, rather worse. Even the Cleaner Production law of China has promotion, cooperation, and consultation among its main strategies, rather than strict rules and enforcements (cf. Mol and Liu, 2005).

8. CONCLUSIONS AND RECOMMANDATIONS

8.1 INTRODUCTION

As introduced in chapter one, small and medium-sized enterprises contribute considerably to the economic and social development of both Viet Nam and HCMC. But at the same time this sector causes severe environmental problems. SMEs thus have been for some time and still are of major concern to the City authorities from an economic and an environmental perspective. Nevertheless, up till now, the design of industrial environmental policies had often a clear focus on large-scale industry, and in the implementation processes of these policies a similar preoccupation was with the major point-source polluters. Environmental policy design and policy implementation have neither specialized at, nor focused on SME. Against this background, seeking, designing and implementing a suitable and effective environmental policy approach towards SMEs has a high priority in HCMC. The first step in such a more focused policy approach towards SMEs should be the collection of relevant environmental data, and the assessment of the effectiveness and adequacy of existing measures. But Viet Nam – and in particular HCMC – is faced with a shortage of environmental information and knowledge, a lack of monitoring capacity, and limited willingness to share environmental data among state, business and the public, which complicates the design and assessment of environmental policy measures for SMEs.

Under such circumstances, this research aimed to contribute to the improvement of environmental policy towards SMEs in HCMC, through a systematic evaluation of the existing governmental environmental policies and measures, and the development of new feasible, effective and suitable environmental policies for greening the SME sector.

In aiming at these objectives the following three questions were given a central place: What have been the effects and the effectiveness of existing pollution control policies towards SMEs in HCMC? Which factors explain the successes and failures of existing environmental policies towards SME? And how can existing environmental policy approaches be improved in order to reduce the environmental impacts of SMEs in HCMC more effectively?

In order to answer these questions, this research relied on three main sources. First, the research built upon and used the theoretical concepts and ideas of Political Modernization, as have been developed especially for the European continent. Political Modernization ideas were used as a source of inspiration and information for developing new ideas of environmental governance in Viet Nam. In addition, the usefulness of political modernization, still being a Eurocentric theory, for developing countries is assessed. How useful are European ideas of political modernization for improving environmental policy arrangements and effectiveness in Viet Nam, nowadays? Is political modernization in Europe the same as political modernization in Viet Nam or should we rather speak of different modes or styles of political modernization? Therefore, while drawing on the political modernization literature in improving environmental policies in Viet Nam, this research contributed at the same time to the scientific literature and theory-formation of political modernization.

Second, best practice experiences from various other countries were assessed to learn about effectiveness, successes and failures of different environmental policy approaches for greening SMEs, and that information was used to compare to HCMC experiences and to design new policy approaches or improve existing ones. Here, similar cases were focused on as much as possible: meaning looking at Asian developing economies, or developing economies from other continents, rather than focusing on European and North-American situations. Third, the main emphasis was on the systematic evaluation of existing Vietnamese policy experiences for greening the SME sector in HCMC. For this, an environmental policy evaluation methodology was developed and applied for the analysis of three extensive cases of prominent pollution control approaches: relocation of polluting enterprises, end-of-pipe treatment approaches and the cleaner production programme. This provided rich information on the final outcomes of these policy programmes towards SMEs, as well as much detail on the implementation processes and the factors that contributed to the successes and failures of policy implementation.

Based on the results drawn from theory, experiences reported in the literature, and research evaluations, this chapter will give the overall conclusions on the current environmental policies towards greening SMEs in HCMC and the recommendation for improvements of policy programmes in the future. The chapter will close with an outline of the future research agenda.

8.2 EVALUATING EXISTING ENVIRONMENTAL POLICIES TOWARDS SMEs

The conclusions start with a comparison of the three environmental policy approaches in terms of the evaluation criteria that were identified in the policy evaluation methodology: effects, effectiveness and cost-effectiveness (8.2.1). Subsequently, an explanation will be given of the general and specific (meaning specific per policy programme) factors contributing to successes and failures of the environmental policy approaches towards SMEs in HCMC (8.2.2). Before drawing any final conclusions, these outcomes will be connected with the theoretical ideas of political modernization, as found in the literature on environmental policy-making and governance in especially Europe (8.2.3).

8.2.1 Comparing Environmental Policies

Before concluding on the effects, effectiveness and cost-effectiveness of the three policy programmes it seems once more useful to draw the attention to the fact that this policy evaluation has been carried out in what we might call an information-poor environment. In Viet Nam in general, and in HCMC in particular, information on the environment, on environmental performances of enterprises, on costs of environmental programmes, and on the effects and effectiveness of all kind of policies is hardly measured, collected and stored systematically neither in the present nor over the past. The effects of an information-poor environment have already been witnessed in the detailed policy evaluations in chapter 5, 6 and 7, and will once more be faced in drawing final conclusions.

Effects

The three evaluated pollution control programmes have achieved effects in terms of environmental protection and behavioural changes of SMEs. All three programmes have shown, for at least part of the companies under these programmes, improved environmental performance and reduced pollution levels. In addition, the number of complaints from residents decreased significantly, which is a signal of improved relationships between industrial manufacturers and surrounding residents as well as of improved reputations of enterprises. But especially with the later category of effects it is difficult to relate that causally to the programmes in questions.

The most significant effect of the successful parts of the Relocation Programme is the prevention of instantaneous pollution exposures to and harmful risks for residents living in densely populated districts of the cities where the SMEs used to be located. In addition, relocated enterprises sometimes raise the income levels of people living close to the industrial zones in the suburbs, although the relocation affects the quality of life of these people if relocation did not go parallel with environmental upgrading of the production facilities. End-of-pipe treatment facilities and the implementation of cleaner production options have resulted in the improvement of the local natural environment and often improved the working environment at the location of the enterprises too.

But the effects of both cleaner production strategies and relocation measures were limited if additional end-of-pipe measures were not effectively implemented in parallel. In that sense, the measures and policy programmes can not be seen as just alternatives, but often have to be implemented as joint packages or strategies in order to reach the final results.

Besides these environmental effects the environmental programmes also resulted in a number of indirect or side effects. In some instances, cooperation between enterprises within one sector increased due to the development of common strategies towards governmental demand on cleaner production or relocation. In several instances, cleaner production projects resulted in further upgrading of the production process. In addition, the Relocation Programme has several non-environmental effects, such as those related to urban development and land-use planning (e.g. to ensure that land is utilised in the most economic and socially beneficial ways), opportunities to enlarge production scale as well as to renovate the technology and machinery of entrepreneurs, and effects on the income and quality of life of people who live in suburbs as well as on employment for neighbouring communities.

Effectiveness

Comparing the effectiveness of the three programmes is hard. While the effectiveness of the Relocation Programme is not too difficult to analyze as clear goals have been stated and the output (and to a lesser extent outcomes) are relatively easy to measure (see chapter 5), the effectiveness of the current end-of-pipe treatment programme and of the adoption of cleaner production approach is much more complicated. For the latter two programmes clear objectives have not been identified at all, and if objectives were identified these are formulated in a vague qualitative way (see chapter 6 and chapter 7). While it is possible to identify and measure the effects of end-of pipe

treatments systems and cleaner production measures at individual enterprises, the policy programmes developed to stimulate these measures lack clear cut goals and thus made it impossible to assess effectiveness of these programmes in terms of outputs and outcomes.

With respect to the effectiveness of the Relocation Programme the conclusions should be that although some progress has been made (as described in chapter 5), the effectiveness is far less than expected and planned because the highly ambitious relocation targets set by the HCMC authorities could not be met before the end of 2004. Factors contributing to that failure have been identified in chapter 5 and are also summarized and highlighted in this chapter.

This research and various literature sources indicate that EoP treatment approaches are often tied in a conventional environmental policy paradigm, where command and control measures prescribe the kind of treatments systems that need to be implemented in order to fulfil the conditions for a licence to produce. Such an approach can only be successful when we deal with a limited number of more or less homogeneous polluters, which can easily be identified, monitored and controlled. With respect to a large number of small and medium sized companies and under the typical Vietnamese circumstances having a weak public administration, lacking state capacity in monitoring and enforcing environmental laws and regulations, large effectiveness can not be expected from such conventional policy programmes. So, even though it was impossible to assess the effectiveness of the end-of-pipe treatment programme due to a lack of specified objectives, it seems plausible to claim that the effectiveness would have been limited if fairly ambitious objectives had been formulated clearly.

A more or less similar conclusion has to be formulated for the effectiveness evaluation of the cleaner production programme. There is no city-wide objectives formulated for cleaner production policy; at best objectives are formulated for specific, donor-driven projects, which are often met. But all attempts to widen the cleaner production programmes to more enterprises outside donor funding hardly seem successful. Therefore, while a detailed, quantitative evaluation of effectiveness is not really possible due to a lack of clearly formulated city wide policy objectives. Optimism about the effectiveness seems out of place even if ambitious objectives would have been formulated.

Cost effectiveness

In general, the case studies showed that most SMEs regard environmental protection and pollution control issues as interruptions in their production routines and costs, rather than as potential investment chances and win-win opportunities. Similar to the case of effectiveness above, the cost effectiveness of the current EoP treatment policy measures and CP approach in HCMC cannot be counted clearly in precise quantitative statements, due to lack of formulated goals.

Still, in more general terms, conclusions on cost-effectiveness of CP and EoP can be made. While EoP treatment measures have relied heavily on technological standards and poses unavoidable non-productive costs on enterprises in terms of investment capital expenditures and operating costs, the CP options provide an incentive (with more flexibility) for SMEs to reduce their pollution in a cheaper, more cost-effective

way while still complying to the laws and regulations. By the same token, the government incurs less enforcement and monitoring costs when CP measures are implemented (which leads many scholars to talk about "win-win" solutions). Hobbs (2000: 156) affirms: "The most effective way of coping with unsustainable practices is to prevent pollution and waste occurring in the first place rather than being forced to clean it up at the end – invariably at greater expense".

From the point of view of state authority, the relocation programme is an effective tool for urban management and planning, as it seeks to ensure that land is utilized in the most economic and socially beneficial way. In that sense, relocating SMEs to suburbs and industrial zones, while reserving the inner-city land for housing and services might be cost-effective, although overall cost calculations are not easy to make. In addition, the relocation of dispersed polluting enterprises to industrial zones is often followed by establishing a centralized wastewater treatment plant, with 'economies-of-scale' advantage in treatment, as well as cost reductions for the state due to concentrated environmental monitoring, enforcement and management. Still, these potential financial advantages have not resulted in a large scale and well-functioning financial support system for relocating enterprises, one of the main bottlenecks for effective relocation policy implementation at the moment in HCMC. At the same time, the relocation programme is escorted by a complicated and detailed state structure and procedures, which consume significant state resources.

8.2.2 Factors explaining successes and failures

As important as actual effect and effectiveness of environmental policies are the lessons that can be learned from the distinct policy evaluations. Which factors have contributed strongly to positive effects and effectiveness, at low costs, of policy programmes; and which factors explain failures?

Factors contributing to success

Throughout the three case studies, the single factor that stands out as most contributing to success is the strong commitment and interest of the leadership of the City People's Committee. Obviously, in a policy sector in which the state is so dominant, and in a society where the state still has major influence upon the organization of social, economic and political life, the commitment of the state – now in the role of the City People's Committee – is a crucial factor for success. The Relocation Programme case study indicates that the commitment and involvement of the HCMC People's Committee is vital, as it is the main organizer in making the Relocation Programme a success. This is to a significant degree also the case for the other two programmes.

With respect to the EoP treatment policy, public pressure (from both civil community and the media) effectively motivates and enhances the environmental enforcement of authorities and as such is a factor for success, especially where control and enforcement activities and capacities of city and district authorities fall short. For all programmes, the need to 'create a positive public image' of enterprises, the public disclosure of polluters and clean enterprises (for instance publishing Black Book and Green Book), as well as further environmental publications in media are factors contributing to the success of environmental policies.

Regarding the cleaner production programme an important factor for success relates to the awareness and commitment of the top management of the involved SMEs. At the same time, in explaining the success of CP projects and programmes one can only acknowledge the vital role of international donors in promoting CP in Viet Nam as well as in HCMC, irrespective of the important role of DONRE and city authorities in CP implementation projects. These international donors have been essential in establishing national and city policy on cleaner production; raising awareness and enhancing capacity of state authorities, industry and universities; and providing financial assistance to initiate CP measures. This foreign support is less evident within the end-of-pipe programme and almost absent in the relocation programme. In addition, financial support from central and city government as well as from local organizations proves essential, especially for SMEs.

In a few cases success factors are rather related to comparative advantages of one policy measure vis-à-vis others. The economic benefits of cleaner production are for some enterprise managers a reason to rather implement CP measures than opt for relocation or advanced end-of-pipe options. But this comparative advantage falls away when a SME needs additional land for expansion, or when it gets compensation for relocation.

Factors contributing to failures

Based on the three case studies, a number of more general factors that are essential in failures or limited successes in effective environmental policy programmes can be indicated. A major factor has been the lack of consensus and cooperation between state and industry in the establishment and implementation of the investigated policies. This includes the absence of constructive interactions between authorities and industries, which allow feedback on and reformulations of policies, instruments and support systems. In addition, the absence of an effective financial support policy focusing specifically on the (usually resource-poor) SME sector has frustrated the implementation of a number of in principle well designed policy programmes. At the same time, severe understaffing, financial constraints, poor management as well as insufficient supervision and monitoring by state authorities also contributed to the unsuccessful environmental interventions in the City. Besides, the inexistence of stable and long-term environmental strategies and policies of the City has caused insecurities for enterprises willing to plan their environmental protection strategies (although one can question how many SMEs are indeed focusing on long term planning of environmental investments in contemporary Viet Nam).

On the enterprises' side there are also a number of regularly returning factors that affected successful environmental policy implementation of all three programs; such as the knowledge, attitude, commitment and opinions of enterprise owners/managers; limited investment possibilities and high costs. While some enterprise specific factors affect the implementation of specific measures, such as the lack of land hampering end-of-pipe technology implementation, and local market dependencies affecting relocation willingness. For each of the programmes separately, factors contributing to failures have been identified in the respective chapters.

A few important factors deserve specific mentioning. With respect to the Relocation Programme, inconsistent and sloppy implementation, inadequate preparation in terms of land planning and infrastructure on relocation sites, unclear financial funding

conditions, as well as complicated disbursement procedures, have been relevant. All of them are at least partly related to the haste of the City People's Committee to complete the relocation process in a limited amount of time (cf. chapter 5). In addition, the policy for relocation has too often not been specifically focused on the conditions of SMEs, for instance with respect to their preferences for financial support (preferential loan, land rent, tax reductions, subsidies).

Failure-contributing factors in the end of pipe programme are related to the considerable financial burden the programme puts on SMEs and the limited possibilities and actualities of industry cooperation in developing common treatment systems. The CP approach witnessed a number on internal barriers (e.g. lacks of awareness on CP, willingness to apply, investment capital, human resources, information on concrete CP options, etc) as well as the external factors (such as lack of correct fixation of natural resource prices, lack of legislation and institution for promotion and support of CP adoption), hampering smooth and successful implementation.

8.2.3 Political modernization in Vietnamese environmental management

As presented in chapter 3, in this research, Political Modernization theory is used to analyze and understand the relationship between state, industry and civil society in current environmental policy measures in HCMC. The basic insight from political modernization ideas is that one can no longer understand environmental policies by only concentrating on state authorities, whether they are national or local. And at the same time more normatively: one can no longer design and implement successful environmental strategies by only focussing on state activities, tasks and roles. The modernization of environmental politics and policies means that the state is dependent on other actors in successfully designing and implementing environmental reform programmes. Moreover, a whole new set of instruments, approaches, arrangements and strategies emerge in between state, market and civil society actors. This section aims to conclude to what extent political modernization has occurred in the context of environmental management in HCMC, and compare the HCMC situation to political modernization in Europe. And subsequently, the question emerges whether an innovation strategy following political modernization really solves some of the state failures and thus leads to better environmental performance.

With respect to the role of the state, this research indicates that the commitment of the HCMC People's Committee is critical in its contribution to the success of most policies in HCMC. The People's Committee supervises and mobilizes City Departments to implement functional activities for achieving social, economic and environmental objectives in the City. The City People's Committee's unchallenged power can often speed up and regulate the behaviour of different actors involved in various programmes and policies. In addition, this research also recognizes that the important role of City Departments is evident. Being directly responsible for related issues, their activities themselves can more or less contribute to the successes or failures of policy measures. Due to severe understaffing, financial constraints, poor management and lack of expertise, the activities of the City Departments are in practice more or less confined to reacting to requests from the City People's Committee or to citizen complaints; they hardly design or implement proactive initiatives or long-term policies. Besides, the role of local authorities in the districts of

the city in environmental reforms of SMEs is often considerable (as proves for instance the case of Tan Binh District, see chapter 5). In general, local governments could play an important role in designing and implementing environmental policy measures towards SME if they would receive sufficient and adequate incentives and resources.

There are no large differences in the role of state authorities if we compare the implementation of our three environmental policy programmes. This research found that the relationship between City authorities and SMEs in both the relocation programme as well as in the investment of EoP treatment systems is rather loose, and mostly one-sided, except in the case of Tan Binh People's Committee. It means that mainly state authorities design, implement and control in a top-down manner, while the enterprises are hardly involved in trying to co-design and co-implement the policy measures. Though there is a difference in the cleaner production programme. Here, City authorities have paid attention to negotiation and have supported businesses in developing and performing CP options. However, this only happened with respects to demonstration projects and in close cooperation with international donor agencies.

Given this all, it can be stated that the still dominant City People Committee's steering power has also a downside; there is an ongoing continuation of top-down, state-dominated, command-and-control approaches and instruments in environmental policy-making. However, the three case studies (see chapter 5, 6 and 7) also prove that of several sprouts of innovative environmental governance practices in a still largely conventional state regulatory setting.

DONRE, as the main City environmental authority, is one of key actors, which could play an important role in the further transformation of environmental governance along lines of political modernization. Besides traditional command-and-control measures, DONRE has already initiated more communicative and supportive approaches in environmental pollution control. Examples of that are the publishing of the Black Books of polluting enterprises and of the Green Book of 'green' enterprises in HCMC, and the organization of many environmental education and awareness raising programmes (Green and Clean Week, Green Sunday, Clean up the World, etc.). Another example is the promotion of cleaner production for various sectors of industry in order to enable enterprises to apply on-site improvements as an alternative for relocation, through demonstration projects, seminars, workshops, trainings on CP concepts. The adoption of the CP approach introduces a new mode of government's environmental management, which breaks with conventional top-down command and control regulation and rather works via negotiation, consultation and cooperation in designing CP programmes and implementing CP measures (see chapter 7). In general, it may be concluded that under the assistance of international donors DONRE is striving to take on more pro-active, flexible and cooperative roles in industrial environmental management rather than only enforcing environmental legislation. But its dominant policy style remains very much inspired by command and control.

Another good example of political modernization ideas emerging in HCMC is related to the Relocation Programme. Tan Binh People's Committee has applied a 'community-based approach' (or a so-called 'negotiated agreement') in local

industrial pollution control[158], a governance approach that resembles many of the ideas of political modernization. The district's authorities and DOSTE negotiated with SME owners in the dyeing industry to choose the best approach and conditions for relocating this sector. Through this approach, on the one hand the SMEs had the opportunity to actively implement their own ideas and choices in the relocation programme, while on the other hand the authorities received feedback from the enterprises and could effectively adjust their governance programme so that implementation went smoothly. In other words, a consensus-oriented cooperation model between authorities and private actors was used to design and implement relocation policy (see chapter 5). Other signs of a transforming policy-style with ingredients of political modernization can be witnessed in the implementation of the Relocation Programme, such as the decentralization from City PC to District PC in preparing and developing the local relocation programme; the decentralization of environmental management from the city to industrial zones; and the emergence of new role for sector associations (see Box 5.2, chapter 5). All these experiments and innovations are far from a routine matter but rather niche projects. But they do point at a sharing of tasks and responsibilities in environmental reform between the state and the market and economic agents, and as such are in line with ideas of political modernization (Sonnenfeld and Mol, 2002; Mol, 1997).

The contribution of international organizations in supporting and establishing these innovations in City environmental policy, strategy and action plans is remarkable (see chapter 7). In many of the political modernization innovations, assistance and support - if not the original ideas and design - have been provided by international academic, consultant and financial organizations. Given that, it affirms that international institutions play a growing role in reforming the conventional environmental policy paradigm in HCMC, which might in the future significantly change the role of the nation-state in environmental reform (Mol, 2003[b]).

Up till now these events are still infrequent exceptions of innovative and flexible environmental policy approaches, which complement the dominant traditional command-and-control approach. Although more convincing evidences and systematic evaluations of these political modernization innovations under Vietnamese circumstances are needed to draw solid final conclusions, it seems that such innovations indeed lead to better environmental performances (in terms of outputs and outcomes) in various cases. As such these innovations may consequently help in solving some of the problems of state failure (although we are unable to make such a claim for a complete transformation of the entire Vietnamese environmental policy regimes towards political modernization). But a further implementation of such political modernization initiatives in HCMC will require strong international support and full commitment from the political and state leadership

With respect to the current circumstances in Viet Nam (in general) and HCMC (in particular), it seems that some additional prerequisites are lacking for a further development and full implementation of political modernization strategies in environmental governance. First, Vietnamese environmental authorities are facing

[158] In fact, 'community-based environmental management' (CBEM) have been initiated via experiments by a cooperative effort of DONRE, People's Committees of District 6 and 11, Portland University (Oregon, USA) and Institute of Environment and Resources (IER). Two demonstration projects were organized in District 6 and District 11 and financially supported by Asian Foundation).

three main barriers: inconsistent institutional arrangements, weak human capacity, insufficient budgets (cf. Phung and Mol, 2004; O'Rourke, 2002; Van Koppen and Mol, 2002). Second, at the moment institutionalized channels for participation in decision-making processes – both by the public and by private economic sectors - are lacking in the City environmental management. At the same time, the role of more general economic organizations, such as sectoral associations or industrial zone organization, is too much blurred and not specified. Third, there is a lack of transparency in the implementation process, a lack of accountability of authorities, and a high risk of corruption, which all are serious concerns that jeopardize successful decentralization processes and the building of modern environmental governance in Viet Nam (cf. World Bank, 2000 and 2004). Consequently, even if we take the encouraging and positive experiments into account, it should be concluded that political modernization in environmental governance is at best a promise for the future in Viet Nam. At the moment, the practice of political modernization is very limited and the prospects for the future are ambivalent. Any conclusion on general transformations in the state environmental policy style towards political modernization is thus premature.

8.2.4 Conclusions

In the last decade, industrial pollution control in HCMC consisted of a variety of instruments and strategies, of which the most important ones were related to traditional command-and-control approaches (e.g. inspection, end-of-pipe treatment, punishment, closure and relocation), while some innovative instruments were recently added to those (e.g. cleaner production, pollution fees, industrial pollution abatement fund; revolving fund). Although each of the measures and approaches has its own successes and failures, as well as own strengths and constraints in implementation, the overall industrial pollution control in HCMC has achieved certain results.

This research shows that the relocation of polluting manufacturers to industrial zones has been the right decision of HCMC authority. Through implementation of the Relocation Programme, the living environment in the city has improved significantly in those districts where relocation was successful. Besides, the relocation proves to be a good opportunity for improving production technology, expanding manufacturing capacity of enterprises, as well as improving land use. Any final conclusion on the effect and effectiveness of this still on-going programme would be premature. Also due to various constraints analysed in previous parts, it could be stated that the result of the Relocation Programme so far is less than expected and planned. The organization and implementation of the Relocation Programme fails on several aspects, but this should not lead to the conclusion of abandoning the programme but rather to an improvement and intensification of it.

The EoP treatment solution is a strong and familiar approach in industrial pollution control, which in some ways fits especially well the typical Vietnamese circumstances of a command and control policy style. However, many constraints of this approach have emerged in the implementation of this approach. As presented in chapter 6, the financial burden, the lack of environmental awareness, the absence of strict enforcement, no essential supports from authorities nor from sectoral associations, the lack of monitoring and supervision from authorities as well as from the public, all make that SMEs can easily escape the requirements of end-of-pipe pollution control.

In reality, polluting enterprises always need to establish an EoP treatment system to meet environment standards, even when they have been relocated or have implemented cleaner production options. Consequently, there is no option to abandon this strategy and solution. But given the shortcomings listed above we have to conclude that up till now the achievement of the EoP treatment approach is far from what is desirable and needed, and the effectiveness is low.

From the assessment it can be concluded that the cleaner production approach in HCMC is a promising instrument that in principle brings both economic and environmental benefits to manufacturing enterprises. Nevertheless, given the characteristics of Vietnamese SMEs and their internal constraints as well as existing external shortcomings (as described in chapter 7 and elsewhere) the current CP approach for SMEs in HCMC needs stronger efforts of the Central and City authorities, as well as of international and local organizations to overcome these barriers. Especially the failure to institutionalize this approach in the overall City environmental policy, and its continuing dependence on foreign assistance and funding, makes the effectiveness of CP for the entire population of SMEs in HCMC low.

Thus, in light of the research questions, this research can draw the following conclusions on the greening of SMEs in HCMC: (1) most SMEs consider responses to environmental challenges as an additional cost and extra obstacle to their production. Practically none of the enterprises feel that environmentally friendly practices can lead to increased earnings or improved competitiveness, certainly not in the short term; (2) the majority of SMEs are not interested in their environmental performance and will only act on improvements when forced externally; (3) by far the most important reasons for adopting pollution control measures are legal and external pressures from authorities and neighbouring residents (and media); economic reasons and increased environmental awareness do not play a significant role yet; (4) current environmental policies, regulations, support programmes, and incentives (including financial ones) seem not to touch the large majority of SMEs, nor change their production and behaviour; (5) most SMEs that are touched by these state policies complain that environmental regulations are rigid and inflexible, and that they are not given sufficient time and financial support to adapt to them; (6) in conclusion, there is a need for further intensification and improvement of state environmental programmes towards SMEs in HCMC.

8.3 TOWARDS BETTER ENVIRONMENTAL POLICIES

As concluded, command-and-control approaches will for some time remain an essential part of HCMC environmental policy style. Within that general framework recommendations for a better environmental policy can be formulate along two lines: (i) an improvement of the various policies and measures within the boundaries of a conventional command and control framework, and (ii) integrate this conventional approach with several innovative concepts and approaches to improve policy effectiveness and environmental compliance of manufacturing enterprises. The philosophy of such a dual strategy of a conventional and an integrated approach is fourfold: (1) while conventional pollution control measures are sometimes expensive, many environmental benefits can still be gained at low cost in HCMC; (2) in several cases pure command and control and coercion have not been effective, while a

combination of coercive and cooperative approaches usually end in more realistic goals and subsequently more effective implementation levels; (3) relying completely on cooperation and negotiation might enhance implementation records, though probably at a very low ambition level (with poor environmental improvements); and (4) under Vietnamese conditions such a cooperative approach alone will be risky, as the conditions for a fully cooperative approach are not fulfilled (e.g. substantial state capacity, advanced monitoring and information collection, effective long term planning within state and private sectors, sufficient external pressure from economic and civil society actors on SMEs).

Based on this starting point a number of more concrete recommendations for improving existing environmental policies can be identified. At first recommendations for improving the existing three policy approaches that have been evaluated, and subsequently record innovations related to each of the core actors involved in greening SMEs in HCMC. In outlining such recommendations the economic, social and political conditions of the City, as well as of Viet Nam, are taken into consideration, preventing utopian proposals that are hardly realistic.

8.3.1 Recommendations on the existing environmental approaches

In the specific empirical chapters (5, 6 and 7) detailed recommendations for improvement have been identified. Here the main recommendations for the three policy programmes will be summarized and generalized.

Relocation of polluting enterprises to industrial zones

The procedure set up in HCMC for relocating SMEs is quite elaborated and on paper well structured and logical. But the implementation falls short, as was concluded from the evaluation in chapter 5. Implementation can be improved by better incentives (for example specific financial supports) to assist enterprises to overcome the difficulties and disadvantages of relocation, adequate preparation in terms of land planning and infrastructure on relocation sites, and consistent implementation. More intensive and better negotiations with (groups of) enterprises and their sectoral associations (as among others the successful case of the HCMC Plastic Association shows) is an important strategy that will improve implementation records. Besides, given the capacity of HCMC authorities responsible for the relocation program, the City government should implement the relocation in a step-by-step approach, rather than the development and implementation of a relocation programme for the whole city and numerous sectors at the same time. Selection and prioritization of some districts and/or some sectors that have ‘hot’ pollution problems seems essential for the City government in order to concentrate human and financial resources, learn from their experiences, and set favourable examples for convincing other districts and sectors.

The final recommendation towards the Relocation Programme is without doubt most elementary. If relocation is selected as one of the major strategies in industrial pollution control, an effective environmental management system in IZs is a prerequisite for avoiding “pollution relocation”. Too often this seems not to be the case in HCMC. The model of Dalian Economic Trade and Development Zone for industrial zone management, especially with its EMS, is a recommendable model that deserves application in HCMC by HEPZA.

Command-and-control measures for end-of-pipe treatment

End-of-pipe treatment systems are still largely implemented via command-and-control approaches. Improvement of these policies are strongly related to a more strict enforcement of environmental regulation and standards by the City authorities, in order to motivate SMEs in abating pollution via the installation but also the functioning of end-of-pipe treatment systems (see also Frijns, 2003; Frijns, Phung and Mol, 2000; Holm, 2000). Given that, conventional recommendations are still essential: government authorities must enhance their capacity (staff, resources, equipments, knowledge) for monitoring effluents and emissions of SMEs, for ensuring good compliance, as well as for establishing and implementing a reasonable pollution discharge fee system as an additional pressure for SMEs. With these conventional recommendations there is a green world to win, seeing the poor record in installation and good functioning of end-of-pipe treatment systems of different kinds in the current SME sectors in HCMC. When that is all settled then a sophisticated identification of cost-effective measures and the communication of such measures to SMEs can accelerate environmental compliance of polluters.

Next to these conventional recommendations, additional pressure might be put on SMEs via a better inventory of pollution sources, a better disclosure of these sources to neighbouring communities and the media, and adequate reactions of state authorities towards community complaints and monitoring.

This is also related to the expectations and preferences of enterprises for a stable, consistent and predictable policy implementation. Laws and regulations need to be clear, known in advance and uniformly and effectively enforced over the whole population of SMEs. In doing so, the City government will gain credibility from business and citizens, and enterprises can and will plan and develop their production and production modifications as well as industrial pollution control measures. Only than can command-and-control policy move away from a pure passive and reactive behaviour of SMEs, to a more proactive investment and long term planning.

Cleaner production approach

As has been mentioned numerous times in various parts of the world, cleaner production (CP) provides on paper a practical and often cost-effective strategy for working on sustainable development. CP can be a promising approach for SMEs, also in HCMC, in terms of both economic efficiency and environmental effectiveness. But in numerous practices it is not.

While numerous demonstration projects have illustrated the advantages in economic and environmental terms of cleaner production, in HCMC this has still not resulted in the widespread application of CP by SME managers outside these (financially supported) demonstration projects. As concluded in chapter 7, the most important factor to successfully adopt cleaner technologies, management and organizational measures is the motivation and involvement of, and the commitment from, the management of SMEs. The recommendations should be aimed at that, but it is far from easy to indicate how that can be done. Various attempts have been made in Viet Nam, with up till now modest success in routinizing CP implementation beyond the demonstration projects Authorities should assist SMEs in taking away the

constraints in cleaner production implementation, and at the same time set conditions that push SMEs towards CP options. Central and City governments can do this by formulating, financing and coordinating CP policies, projects and facilities and by institutionalizing CP policies via promotion, cooperation, and consultation with SMEs. Here is a typical case where strict rules and enforcements have to go along with cooperation and negotiations.

The success of the CP approach largely depends on the ability to mainstream cleaner production into all major policy areas, beyond environmental policies (cf. Evans and Stevenson, 2001; Lindhqvist, 2001). Thus CP policies, measures and support should be integrated into industrial and economic policies, among others. There are still numerous possibilities in other policy areas (taxation, technology development, export promotion, etc) to stimulate SMEs to be more active in implementing CP. China's recent Cleaner Production Promotion Law might set an interesting example for Viet Nam and HCMC, although it is too early to judge the law's effectiveness.

8.3.2 Recommendations for actors

The evaluation of existing environmental policy programmes enables to formulate recommendation that surpass these individual programmes and are of a more general nature. Three sets of recommendations for greening SMEs will be mentioned, related to respectively the state and state authorities, the SMEs and social communities.

Recommendations related to state authorities

With respect to state authorities four main recommendations can be formulated, following the investigations: state capacity building, institutional reform, working with negotiated agreements in combination with conventional policy styles, and financial incentives.

As mentioned in all three evaluations capacity building and capacity improvement of state authorities is a key recommendation, which has wider applicability beyond these three programmes. Capacity building firstly involves of course the enhancement of state management capacity and capability at all levels of environmental policy-making and implementation on various items, such as:

- establishing and implementing environmental policy;
- developing technical and monitoring capabilities;
- control, inspection and enforcement;
- communication, education and 'propaganda';
- financial and personnel resources.

But it is not only capacity building that is needed to improve the policy-making and implementation power of state authorities. It also involves the reform of the institutional structures and state systems that are responsible for environmental policy-making and implementation, among which:

- enhancing the role of local authorities vis-à-vis the central ones;
- enhancing the authority of environmental management units of EPZs and IZs for enforcing environmental laws and regulations;
- involving other (non-environmental) departments and agencies into environmental policies and make them responsible and accountable.

Such state reforms (in terms of decentralization, privatization, integration) should extend to touch state environmental management tasks as monitoring, certification, auditing, supervision, inspection or even managing environmental projects, as well as to cover environmental service provision, among which waste collection, recycling and treatment, and the maintenance and operation of public waste treatment facilities.

Directly related to enhancing state capacity and institutional reform is the advancement of what is popularly called good governance. As presented in chapter 3, good governance must contain four characteristics: transparency, accountability, predictability and participation (cf. World Bank, 2000). Transparency is understood as ensuring information disclosure related to environmental laws and regulations, the implementation process of environmental policy, and environmental quality and emissions of specified areas and locations. Such information needs to become available, understandable, reliable and provided timely. Accountability means the obligation to give answers and explanations concerning environmental authorities' actions and performances to the public. Predictability refers to the rule of law, and to policies and strategies that are clear, known in advance and uniformly and effectively enforced. Lastly, participation allows citizens a voice in the policy and decision making process, not just during elections but also in day-to-day environmental policy-making and implementation processes. The preconditions for good governance are too often not fully implemented, as witnessed in the three case studies.

At the same time, and thirdly, these capacity building and institutional reform recommendations need to be paralleled by the building of some basic consensus among a range of stakeholders, in order to improve compliance. Negotiations, cooperation and consensus approaches provide SMEs with opportunities to launch their ideas, interest, preferences and choices, and at the same time provide the authorities with feedback and commitment from the enterprises. This will improve the design of policy programmes (to make them flexible and better adjusted to the local circumstances of SMEs in HCMC) as well implementation (by creating at an earlier phase commitment of SMEs and enlarging the possibilities of SMEs to comply). In the international, literature negotiated agreements are increasingly seen as an appropriate vehicle to include such perspectives and ideas in state environmental policies. The World Bank (1999: pp.123) states that "such agreements give industry and communities a voice in determining specific pollution reduction targets and offer firms flexibility as how to comply with targets". City People's Committee should encourage and facilitate such environmental agreements in pollution control in HCMC, be it designed for the specific circumstances rather than as a copy of OECD models. At the same time when working with such negotiated agreements and policies it should be made clear which parts of environmental policies are negotiable, and which parts remain the sole responsibility of the state. Objectives and standards will

be more part of the latter, while measures, time paths and technological means could become subject to negotiation agreements.

Financial insufficiency is a permanent obsession for most SMEs, and a constantly returning reason for not implementing policy measures and environmental investments for pollution control. While various initiatives have been made by the City government to support enterprises in environmental pollution control, as has been indicated in the chapters above, the general picture is of a rather fragmented financial policy with large administrative hurdles and only few SMEs really financially profiting from it. In order to assist SMEs in better compliance of environmental regulations and programmes, City government needs to establish a suitable, comprehensive and non-bureaucratic financial support policy (with, among others, low interest loans, tax exemptions, 'loan guarantee', subsidies), as well as a policy to promote and encourage SMEs in lending from local financial institutions. A short term improvement and simplification needs to be made with respect to the procedures for approval, disbursement and collateral in the Industrial Pollution Abatement Fund and Revolving Fund (see Box 7.1) and in other financial funds.

Recommendations related to SMEs

While this research focused especially on the evaluation of state environmental policies, programmes and approaches towards greening SMEs, a number of recommendations for improved pollution control programmes need to be implemented at SMEs rather than at the state authorities.

The failure to adequately react to governmental policies and programmes by SMEs is often also related to the poor internal organization and management of SMEs when environmental considerations are at stake. This is especially strongly felt by SMEs, as - compared to larger industries - their environmental management capacity and internal organization is often underdeveloped, not only in Viet Nam but in many other countries. The introduction of environmental management systems (EMS), as for instance designed and standardized by the International Standard Organization via ISO 14001, is usually referred to as a helpful model to improve internal environmental management at private enterprises. The EMS is a logical complement to cleaner production. It helps enterprises establish a structured process of continuous environmental improvements, which are systematically monitored, measured and reported. Prerequisites for a successful EMS include management's commitment to improve performance, as well as strong existing managerial and measurement capacities (cf. World Bank, 1999). Similar to CP adoption, however, resource limitations are constraining EMS introduction - time, knowledge, skills, staff and finances (cf. Rao et al., 2006; Johannson, 2000; World Bank, 1999)[159]. In addition, Johannson (2000: 91) states that the most critical problem for SMEs to introduce EMS is the absence of immediate market drivers for ISO 14001, and "without pressure from customers or higher up the supply chain from the larger business, there is no commercial imperative for SMEs to improve their environmental performance". Unless an EMS certification is needed to satisfy the requirement of international trade,

[159] According to Johannson (2000), based on the Austrian experience, costs for training, documentation and verification to the Eco-Management and Audit Scheme (EMAS) run to about US$ 100,000. In Canada, Argentina, Colombia and Austria, for example, training support provided to SMEs is subsidized by government.

recommendations for EMS introduction at SMEs seems to be an unrealistic challenge for most SMEs in HCMC.[160]

Rather than recommending more or less standardized internal environmental management systems for individual SMEs, it seems more feasible to (i) increase the capacity of SMEs on a more flexible and taylor-made basis for individual SMEs, and (ii) set up supporting structures for groups of SMEs, along sectoral or locational lines.

Promoting good management skills in SMEs deserves critical attention and the key addressee is still the general manager. He needs to be convinced that environmental management is of crucial importance. The most effective way to convince SME managers on environmental compliance and embracing innovative concepts (e.g. cleaner production, EMS) is still believed to run via demonstrating that these concepts can effectively reduce costs and improve company competitiveness (cf. Gerrans and Hutchinson, 2000). As demonstration projects have difficulties of trickling down to the wider SME community (as seen in the cleaner production case study), national and city plans and programmes to raise awareness of the benefits of pollution prevention approaches, to supply professional knowledge on environmental technology, as well as to improve management skills throughout the industrial and business sectors remain useful and necessary. In the end SME managers need to discover how they are going to deal internally with environmental management in their own companies. The SME community is too diverse to come up with standardized solutions.

In improving internal environmental management at SMEs sectoral associations have a promising role to play in information sharing, awareness raising, and technical support to SMEs. Up till now this role in HCMC and in Viet Nam in general is still marginal. But experiences from other countries show that sectoral associations can act as an 'entering port' or 'gatekeeper' for providing information on environmental issues and encourage environmental improvement in their enterprises (De Bruijn and Lulofs, 2000; Hobbs, 2000; Frijns and van Vliet, 1999; Mol, 1995). Besides, these organizations could also play a bridging role in negotiations, consultations and consensus building between authorities and enterprises.[161] The active and innovative role of the HCMC Plastic Association shows that also under Vietnamese conditions sectoral associations can become crucial actors, and this example deserves to be replicated. Other Vietnamese investigations have shown that industrial zone management organizations can play a similar role for SMEs (re)located in geographical concentrations or zones (Phung, 2002; Tran, 2003). City, sectoral and locational SME support centres need to be set up, and streamlined with the coming of a Cleaner Production Centre in HCMC, to provide know-how, technology, technical and managerial assistances in waste abatement and environmental protection. Such organizations, platforms or service centres are also crucial in exchanging experiences and circulating best practices and demonstration project models.

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[160] This is different for larger enterprises, especially foreign or joint-ventured companies whose partners come from the OECD countries (Phung, 2002). Same statement is also recognized in Indonesia (Bratasida, 2000:.308): "only multinational and powerful businesses are proactive and able to keep up with international requirements, such as ISO 14001 and ISO 14020-the international standard on eco-labelling". By the end of 2004 only 85 companies in Viet Nam had ISO 14001 certified environmental management systems (ISO data).

[161] With respect to the role of industrial associations, Visvanathan et al. (2005) state that networking of the various industrial associations, financial organizations, local administrative units, etc. will foster the implementation of cluster specific policies, thus driving industrial sustainability.

Recommendations related to social communities

Up till now communities and civil societies have been largely absent in any of the environmental policies that have been evaluated in this dissertation. There is much to gain in terms of improved environmental performance of SMEs and better environmental policy implementation if communities and civil society are given the opportunity to play a larger role in SME environmental policies. I concentrate here on two main recommendations: information disclosure and public participation

Information on environmental pollution by SMEs is hardly available for the public, but often environmental authorities equally lack systematic information on pollution levels of SMEs. An effective disclosure (via enterprises, authorities and media) of information on pollution levels, emissions and their dangers could gain two benefits. First, it allows interested citizens to monitor the environmental compliance of SMEs, put more pressure on them, and thus change their behavior. Second, more information, complaints and reactions from local citizens can help authorities to set up effective policies and make priorities in pollution reduction. While advanced systems of information disclosure exist in OECD countries (such as the US and EU), also less advanced systems in Asian countries provide interesting examples on how to start with widening information disclosure programs beyond the current HCMC initiatives of green and black books.

In enhancing environmental management in and outside IZs, the City People's Committee should encourage and recognize the role of organizations such as local people's committees, local organizations such as the Hydraulic Service Exploitation and Management company, local residents as well as media (television, news paper) in monitoring and supervising environmental violations by enterprises. Such recognition has been acknowledged hardly up till now and no systematic policy has been institutionalized to profit from these additional non-state organizations in monitoring and enforcement of environmental measures and regulations.[162] To help bridge this gap, the supervisory role of citizens in the surroundings as well as of local people's organizations, such as the women's union or veterans' union, should be considered, facilitated, enabled and stimulated. This recommendation is of course part of a political modernization agenda, be it applied to Vietnamese characteristics. When finding pollution situations or environmental violations such non-state actors can negotiate and discuss directly with the polluting enterprises or if necessary, can send their complaints to authorities or the media. Promising and well-working first steps are there. For example, the HCMC television (HTV) has its own ''hot line'' (call 9103588) via which citizens can complain on any local environmental pollution. HTV can immediately send staff to record the pollution situation in the field and broadcast it on television. Community and media could act as key drivers to enhance and complement the state's environmental monitoring and enforcement in Viet Nam. Public participation can also assist in reducing the costs of implementation of environmental controls (cf. UNDP, 1995). In addition, O'Rourke (2002) states that

[162] In practice, the Government has institutionalized grassroots participation by issuing the Decree 19/CP on the regulation of Exercise of Democracy in Communes (the "Grassroots Democracy decree") in 1998. The decree offers a crucial and encouraging legal framework for increasing community participation at the local level. Although this decree is very encouraging, challenging steps remain in the active implementation. The World Bank (2000: .32) suggests that "to realize full community participation, Government leaders need to understand that community participation involves more than contribution of local resources, i.e. that it includes actual involvement in decision making".

community action is also helping to shine light on local level corruption by increasing transparency in all state environmental actions. Recently, the central state has made combating corruption one of the key focal points.

Whether it is labelled 'community-driven regulation' (O'Rourke, 2004 and 2002), 'informal regulators' (Phung and Mol, 2004) or 'community-based environmental management' (CBEM), communities and local organizations have all the potential to become a very useful supplement to the state authorities in industrial pollution control approach in HCMC and Viet Nam. This fully expresses the essence of the President Ho Chi Minh's principle that "people know, people discuss, people execute and people supervise". The City government should facilitate, enable and support this approach by systematically institutionalizing community participation, widely distributing environmental information and effectively developing awareness programmes and campaigns.[163]

8.4 ELEMENTS FOR A FUTURE RESEARCH AGENDA

The various recommendations, as introduced in the last section, provide a first step towards a future research agenda. Nevertheless, in order to develop these recommendations into practical proposals, additional, more policy design oriented research is needed. How should Vietnamese authority operationalize and combine improved command-and-control requirements (e.g. better enforcement of the legislation, guidelines and licensing), market-based incentives (e.g. a duty and tax system for waste disposal, a realistic pricing system for natural resources, a simple and easily accessible loan mechanism for financial support) and communication and community approaches (e.g. institutionalizing of the public participation, effective public disclosure) in order to respond to the current and future – economic and environmental - needs of both SMEs and HCMC citizens?

Secondly, the characteristics and identity of HCMC (e.g. large population density; diversity in production systems; serious and complicated environmental problems; creative, active and dynamic socio-economic system) differ from many other Vietnamese cities and provinces (but corresponds largely with for instance Ha Noi), resulting in the question of the generalizability of the results for other Vietnamese localities (e.g. with lower socio-economic development; less, and less diverse, enterprises; weaker environmental management capacity; lower population density). At the same time, through crosschecks and literature references, this research revealed a number of similarities and differences with environmental policies towards SME in other countries. Further investigations along both lines would be valuable.

Third, parallel to the 'doi moi' (renovation) in economic development and an increasing environmental awareness of society, a new trend of environmental governance, one operating via negotiation, consultation and cooperation rather than via regulation and enforcement, can be witnessed in HCMC. It would need further study and experiments to indicate to what extent such a new governance model will contribute to more effective environmental policies (e.g. cleaner production, relocation) and a better institutionalization of environmental policies, under the

[163] A more advanced step in participation of social communities and civil society in environmental policy is to provide them also a role in policy design and in policy evaluation.

current circumstances of Viet Nam (with its own specific institutional mechanisms). As part of that, the application of innovative approaches (for instance, negotiated instruments, eco-industrial parks, advanced information disclosure systems) in Viet Nam deserves further attention.

Finally, returning to the theoretical framework, it is possible to use political modernization as a heuristic tool and sensitizing concept to identify sprouts of new environmental governance initiatives in HCMC, and to formulate recommendations for further developing and reforming existing environmental policies in order to overcome shortcomings and failures, a 'Vietnamese political modernization' model has not yet been formulated. In the earlier parts of this dissertation a warning has been given not to just copy the western models or theories of ecological and political modernization to Viet Nam. There is still a research agenda to fill on how a political modernization model or theory for Viet Nam would look like, and on which points this differs from western models. This grows to be even more interesting in times of globalization and the further opening up of Viet Nam to the regional and global economy, polity and community, as these would arguably push at least to partly harmonization of environmental policy models.

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APPENDIXES

Appendix 1: OFFICIAL COUNTRY DEFINITIONS OF SME

(Source: Ayyagari, Asll & Kunt, 2003)

Country	Official Definition of SME (in employee number)	Time Period of Data	Source
Albania	500	1994-95	United Nations Economics Commission for Europe
Argentina	200*	1993	Inter -American Development Bank-SME Observatory
Australia	100	1991	APEC, 1994: *The APEC Survey on Small and Medium Enterprises.*
Austria	250	1996	Eurostat
Azerbaijan	250*	1996-97	United Nations Economics Commission for Europe
Belarus	250*	1996-97	United Nations Economics Commission for Europe
Belgium	250*	1996-97	Eurostat
Brazil	250	1994	IBGE-Census 1994
Brunei	100	1994	APEC Survey
Bulgaria	250*	1995-97,1999	Center for International Private Enterprise, Main characteristics of SME: Bulgaria Country Report, Institute for Market Economics
Burundi	100	90s	Regional Program on Enterprise Development Paper # 30
Cameroon	200	90s	Regional Program on Enterprise Development Paper # 106
Canada	500*	1990-93, 1996, 1998	Presentation to the Standing Committee on Industry, Science and Technology, APEC Survey, Globalization and SME I997(OECD)
Chile	200*	1996	Inter -American Development Bank-SME Observatory
Colombia	200	1990	Inter -American Development Bank-SME Observatory
Costa Rica	100	1990,92-95	Inter -American Development Bank-SME Observatory
Cote D' Ivoire	200	90s	Regional Program on Enterprise Development Paper # 106, #109
Croatia	250	1998	United Nations Economics Commission for Europe, Center for International Private Enterprise
Czech Republic	250*	1996	United Nations Economics Commission for Europe
Denmark	500	1991-92	Globalization and SME 1997(OECD), International Labor Organization
Ecuador	200	1994	Inter -American Development Bank-SME Observatory
El Salvador	150*	1993	Inter -American Development Bank-SME Observatory
Estonia	250*	1996-97	United Nations Economics Commission for Europe
Finland	250*	1996-97	Eurostat Database
France	500	1991,1996	International Labor Organization, OECD SME Outlook
Georgia	250*	1996-97	United Nations Economics Commission for Europe
Germany	500	1991,1993-98	Globalization and SME 1997 (OECD), Fourth European Conference paper
Ghana	200	90s	Regional Program on Enterprise Development Paper # 106, #109
Greece	500	1988	OECD
Guatemala	200*	1990	Inter -American Development Bank-SME Observatory
Honduras	ISO	1990	Inter -American Development Bank-SME Observatory

Hong Kong, China	100	1993,2000	APEC Survey, Legislative Council 17 Jan 2005
Hungary	250	1997	United Nation Economic Commission for Europe
Iceland	100	1996	Eurostat Database
Indonesia	100	1993	OECD Paper, Speech of State Minister of Cooperatives and SME in Indonesia
Ireland	500	1997	Globalization and SME 1997 (OECD)
Italy	200	1995	Russian SME Resource Center, Eurostat Database
Japan	300	1991,1994,1996, 1998,1999	Globalization and SME 1997 (OECD), SME Agency in Japan
Kazakhstan	500*	1994	United Nation Economic Commission for Europe
Kenya	200	90s	Regional Program on Enterprise Development Paper # 106, # 109
Korea, Rep.	300	1992-93, 1997,1999	APEC Survey, OECD, Paper titled "Bank Loans to Micro-enterprises, SMEs and Poor Households in Korea"
Kyrgyz Republic	250*	1996-97	United Nation Economic Commission for Europe
Latvia	500*	1994-95	United Nation Economic Commission for Europe
Luxembourg	250*	1996	Eurostat Database
Mexico	250	1990-97	Inter.-American Development Bank-SME Observatory, APEC Survey
Netherlands	100	1991-98	G8 Global Marketplace for SME, Globalization and SME 1997 (OECD)
New Zealand	100*	1991,1998-00	SMEs in New Zealand, Structure and Dynamics, APEC Survey
Nicaragua	100	1992	Inter -American Development Bank-SME Observatory
Nigeria	200	2000	Regional Program on Enterprise Development Paper #118
Norway	100	1994,1990	European Industrial Relations Observatory
Panama	200	1992	Inter -American Development Bank-SME Observatory
Peru	200	1994	Inter -American Development Bank-SME Observatory
Philippines	200	1993-95	APEC Survey, Situation Analysis of SME in Laguna
Poland	250	1996-97,1999	United Nation Economic Commission for Europe
Portugal	500	1991,1995	OECD
Romania	250	1996-1999	United Nation Economic Commission for Europe, Center for International Private Enterprise
Russian Federation	250*	1996-97	United Nation Economic Commission for Europe
Yugoslavia Fed. Rep.	250*	1999	Center for International Private Enterprise
Singapore	100	1991,1993	APEC Survey
Slovak Republic	500	1994-95	United Nations Economic Commission for Europe
Slovenia	500*	1994-95	United Nations Economic Commission for Europe, SME in Central and Eastern Europe, Barriers and Solution by F. Welter
South Africa	100	1988	World Bank Report
Spain	500	1991,1995	OECD
Sweden	200	1991, 1996	OECD
Switzerland	500*	1991, 1995, 1996	OECD
Taiwan	200	1993	APEC Survey
Tajikistan	500*	1994,1995	United Nations Economic Commission for Europe
Tanzania	200	90s	Regional Program on Enterprise Development Paper # 106, #109
Thailand	200	1991,1993	APEC Survey

Turkey	200*	1992,1997	SME in Turkey
Ukraine	250*	1996	United Nations Economic Commission for Europe
United Kingdom	250*	1994,1996-00	Department of Trade and Industry, UK
United States	500	1990-1998	Statistics of US Businesses: Microdata and Tables
Vietnam	200	1995	Nomura Research Institute Papers
Zambia	200	90s	Regional Program on Enterprise Development Paper # 106, #109
Zimbabwae	200	90s	Regional Program on Enterprise Development Paper # 106, ff 109

Note: * indicates either the country has no official definition of SME or we don't have data for the country's official cut

Appendix 2: CATEGORIZATION OF INVESTMENT PROJECTS

(Source: Decree No. 12/2000/ND-CP dated 05/5/2000 of Government)

The investment projects (excluding foreign direct investment (FDI) projects) are categorized into 3 groups by following characteristics:

N°	Investment project group	Total invested capital
I. Group A projects		
1	National defence and security projects. Infrastructure construction of IZs and EPZs.	Regardless of the amount of invested capital
2	Projects: Toxic matter or explosion matter production	Regardless of the amount of invested capital
3	Industrial projects: Electricity; gas-oil exploitation & processing; chemical; fertilizer; mechanical engineering (include ship buying and shipyard, automobile assembly); cement; metallurgy; minerals exploitation & processing. Transportation projects: Bridge, seaport, river-port, airport, rail-road, national highway.	Over VND 600 billion (US$ 40 million)
4	Projects: Hydraulic construction; transportation (differs I-3 item); water supply; sewerage and drainage infrastructure construction; electric engineering; postal and telecommunication; electronic; information technology, pharma-chemical; medical equipment; material production; Projects in the field of real estate business.	Over VND 400 billion (US$ 27 million)
5	Projects: engineering infrastructure of new urban area; light industries: ceramic, porcelain, glass, print. Projects: National park, natural conservation area. Projects: Procurement and installation of construction machine; agriculture & forestry; aquatic culture; processing of forestry-agricultural product.	Over VND 300 billion (US$ 20 million)
6	Projects in the field of healthcare, culture, education, training, science research; radio and television broadcasting; medicine producing; civil construction, storage & warehouse, tourist, sport and others.	Over VND 200 billion (US$ 13 million)
II. Group B projects		
1	Industrial projects: electricity, gas-oil, chemical, fertilizer, mechanical engineering (include ship buying and shipyard, automobile assembly), cement, metallurgy, minerals exploitation & processing; Transportation projects: bridge, seaport, river-port, airport, rail-road, national highway	VND 30 - 600 billion (US$ 2 - 40 million)
2	Projects: hydraulic construction, transportation (differs II-1 item), water supply; sewerage and drainage infrastructure	VND 20-400 billion (US$ 1.3 – 27 million)

	construction; electric engineering; postal and telecommunication; electronic; information technology, pharma-chemical; medical equipment; material production; Projects in the field of real estate business.	
3	Projects: engineering infrastructure of new urban area; light industries: ceramic, porcelain, glass, print. Projects: National park, natural conservation area. Projects: Procurement and installation of construction machine; agriculture & forestry; aquatic culture; processing of forestry-agricultural product.	VND 15 - 300 billion (US$ 1 - 20 million)
4	Projects in the field of healthcare, culture, education, training, science research; radio and television broadcasting; medicine producing; civil construction, storage & warehouse, tourist, sport and others.	VND 7 - 200 billion (US$ 0.47 - 13 million)
III. Group C projects		
1	Industrial projects: electricity, gas-oil, chemical, fertilizer, mechanical engineering (include ship buying and shipyard, automobile assembly), cement, metallurgy, minerals exploitation & processing; Transportation projects: bridge, seaport, river-port, airport, rail-road, national highway. School in planning area (rregardless of the amount of invested capital)	Under VND 30 billion (US$ 2 million)
2	Projects: hydraulic construction, transportation (differs III-1 item), water supply; sewerage and drainage infrastructure construction; electric engineering; postal and telecommunication; electronic; information technology, pharma-chemical; medical equipment; material production; Projects in the field of real estate business.	Under VND 20 billion (US$ 1.3 million)
3	Projects: engineering infrastructure of new urban area; light industries: ceramic, porcelain, glass, print. Projects: National park, natural conservation area. Projects: Procurement and installation of construction machine; agriculture & forestry; aquatic culture; processing of forestry-agricultural product.	Under VND 15 billion (US$ 1 million)
4	Projects in the field of healthcare, culture, education, training, science research; radio and television broadcasting; medicine producing; civil construction, storage & warehouse, tourist, sport and others.	Under VND 7 billion (US$ 0.47 million)

(Note: US$ = VND 15,000 in 2000)

Appendix 3

THE TEMPORARY INCENTIVE POLICIES FOR ASSISTING ENTERPRISES IN THE RELOCATION PROGRAMME

(Attached to the decision No.81/2002/QD-UB dated 08/7/2002 of People's Committee of HCMC)

A) The incentive policy for assisting of the investment of new constructions

A.1 Employment of the budget from selling old land and facilities

1. The procedure of land sale

1.1 For state-owned enterprises:

After the responsible authorities have approved a proposal for selling old land and facilities, the enterprise has to re-measure the area of the old land and facilities, and map these, then send the whole document to the City Council of Public Land and Housing Pricing. The Council will:

- Price the old land and facilities by following the current value of free market.

- Auction off the old land and facilities by following the current regulation of the City.

For special (exceptional) cases, the City People's Committee will make the decision by itself. In case of enterprises belong to the central government, the City People's Committee will discuss with the related ministries to make the decision.

1.2 For private enterprises but with part of the governmental joint stock (collective sectors):

In case the old land and facilities belong to the government, an enterprise has to follow the state enterprises requirements (mentioned in 1.1).

1.3 For the others (out of the mentioned categories of enterprise in 1.1 & 1.2):

Enterprises will make a decision by themselves as requirements of the current legislative procedure.

In case enterprises are unwilling to sell old land and facilities as mentioned in parts 1.1, 1.2 and 1.3, they can keep those for purposes such as common houses, offices, etc. but these new usages have to comply with the City master plan.

2. Management and employment of the budget collected from selling old land and facilities

2.1 For state-owned enterprises:

The value of the estate comprises two components: the value of the property on land (facilities) and the value of the land itself.

- The value of the property on land: It can be the government's or enterprise's possession. The enterprise is allowed to employ this value (budget) as regulated by the current legislation.

- The value of the land: For the state-owned enterprises, after deducting the cost of the land transferring such as mapping, administrative expenses, tax, etc. the remaining value has to be transferred into the temporary account of the City Department of Finance (DOF) at the National Treasure in HCMC and it will be controlled conscientiously. For the state-owned enterprise of central government, the remaining has to be transferred into the temporary account of the enterprise at the National Treasure in HCMC.

Only when having permission of the responsible authorities, the enterprise can employ the budget previously kept at its temporary account for building new production establishments in industrial zones.

2.2 For enterprises belonging to collective sectors.

- The value of the property on land: The enterprise can employ it as regulated by the current legislation.

- The value of the land (if any): If it is the government's possession, the enterprise has to transfer it into the temporary account of DOF at the National Treasure in HCMC. The City People's Committee will consider an incentive loan to lend the enterprise with the intention that the enterprise can employ it for building new production establishments in industrial zones. If it is not the government's possession, the enterprise can make the decision by itself as regulated by the current legislation.

2.3 For the others: They can make a decision by themselves.

A.2 The incentive policy on the loan with low interest

1) For the state-owned enterprises operating before the Law on Environment Protection (LEP) became effective (hereafter called Group 1):

The investment capital for new production establishments: The enterprise can employ the budget from selling the old land and facilities (including the value of the property on land and of the land itself) and other financial sources they might have.

In case the enterprise intends to build new production establishments but is lacking the investment capital, in spite of its old land and facilities were or have not yet been sold, or when there is no land for sale (renting only): the City People's Committee will financially subsidize the interest of a loan. Accordingly, regardless of how much the original interest of the loaning source is, the City will give a subsidizing rate of the annual interest of 3-4% of the loan, the remaining rate of the interest will be covered by the enterprise itself. The subsidizing rate of the interest depends on the time of the relocation:

+ If the enterprise relocates its production in 2002, the subsidizing rate of the interest (i.e. compensation rate) should be 4% of the loan per year.

+ If in 2003, it should be 3.5%.

+If in 2004, it should be 3.0%.

Subsidizing duration: started from lending the loan until the enterprise can regain the value of its old land and facilities through selling. However this duration must not last more than two years (special cases have to be reported to the City People's Committee).

2) For enterprises operating after LEP became effective but that have not yet carried out the pollution treatment as required by the Law (hereafter called Group 2):

The enterprise has to carry out the pollution treatment using its own budget. If lacking the financial capacity, the enterprise can ask for a loan from the Industrial Pollution Reduction Fund of the City.

3) For illegal enterprises unlicensed for production (hereafter called Group 3):

These enterprises can not receive any assistance from the City authorities. They have to comply with the current regulations.

B) The incentive policy on the taxation for Group 1 in the relocation program:

All enterprises of Group 1, when relocated in the industrial parks or centralized zones, will obtain a Certificate of Investment Incentive from the City People's Committee and benefit the following incentives:

1) Exemption from land rental charge (if enterprise rents land) for three years since signing the contract for land rental. In case the enterprise employs at least 100 workers on a yearly basis, the exemption will be extended to six years in total.

2) The Business Income Tax is only 25%.

- An exemption from the business income tax for two years and a reduction of 50% of this tax for the next two years. If the enterprise employs at least 100 workers, it will be given an exemption from the business income tax for two years and a reduction of 50% of this tax for the next four years.

- The additional business income tax will not to be charged.

3) If the enterprise has an investment project for enlarging the scale of production or increasing the quality of production, it will be exempted from the business income tax for the profit resulting from these investments as follows: exempting from the mentioned tax for one year and a 50% reduction of the tax for the next four years.

4) The enterprise does not have to pay importing tax for facilities that can not be produced in Viet Nam or could, but have unsatisfactory quality:

a. Equipment, machines, and specific vehicles (accompanied with the production package) that are imported to enlarge the scale of production or/and increase the quality of production.

b. Vehicles for the travel of staffs and workers.

Remarks: Equipment, machines, and vehicles mentioned above have to be declared at the Port Custom in order to become legal for the above incentive consideration.

5) The enterprise can apply for a medium or long-term soft loan from the City Fund for Developmental Investment Assistance which accounts for 70% of the proposed investment.

C) The incentive policy for arranging the relocating site of the production and the new settlement of the staff and workers (for Group 1):

1) For the small-sized and backyard industries or units of handicraft village which need to be promoted (according to the governmental strategy) but lack sufficient budget for relocation, the District People's Committee will be responsible for giving these enterprises (situated in the same district) advantages in relocating them into industrial parks or centralized zones of the City, or assisting them to change their production category to a new business more comparable with the current market, or closing them down based on a carefully consideration in terms of economic effectiveness (according to the Law on Business).

In case the enterprise is allowed to be situated at the old location, the City will give it an incentive loan without any interest from the Industrial Pollution Reduction Fund with the intention that the enterprise can carry out its pollution treatment proposal approved by the City.

The City allows companies specialized in environmental infrastructure construction to invest in the construction of new industrial or semi-industrial centralized zones for relocating the district-level industries as mentioned.

Relocating enterprises into industrial or semi-industrial centralized zones, in order to reduce the investment cost of land in these zones, resulting in the reduction of the land rental charge later, the City will financially subsidize infrastructure-invested companies with a 100% compensation of the interest of the loan which is lent for the construction of roads, wastewater treatment plants, and public works serving workers' lives in these zones (e.g. kindergartens, clinics). The subsidizing duration of these interests lasts from starting the constructions until stable operation of the production but not longer than five years from the delivery of the loan.

2) For the medium and large-sized industries employing many employees, if the industry needs a loan to build houses to rent out or sell to employees, the City will subsidize an interest of 3% per year regardless of the original interest of the loan. The subsidizing duration starts at submission of the loan but is maximum three years.

3) To change the structure of labouring resources of the City, as well as to increase the rural income, and decrease the natural migration to urban areas, the City encourages industries to employ local people of the community by subsidizing these

industries with a rate of 300,000 VND/employee/year (only for employees who are employed from 2002 to 2004). This subsidy has to be used by industries to train their new employees.

D). The policy on awarding active industries

To encourage and promote timely industries (Group 1) that actively participate in the relocation program, the City will use the City's Fund for Industrial Pollution Reduction to award industries active in relocating their production early.

The City People's Committee assigns the Executive Board of the programme to check and report the list of active industries in the relocation programme qualified for awarding. These are levels of the monetary prize:

1) If the industry finishes its relocation into the new site in 2002, it will be awarded with a maximal rate of VND 500,000,000 depending on the number of employee:

- For the industry with above 500 employees, the prize should be 500,000,000VND.

- For the industry with 400 - 500 employees, the prize should be 400,000,000VND.

- For the industry with 300-below 400 employees, the prize should be 300,000,000VND.

- For the industry with 200-below 300 employees, the prize should be 200,000,000VND.

- For the industry with 100-below 200 employees, the prize should be 100,000,000VND.

- For the industry with 50-below 100 employees, the prize should be 50,000,000VND.

- For the industry with 10-below 50 employees, the prize should be 30,000,000VND.

- For the industry with below 10 employees, the prize will be considered.

2) If the industry finishes its relocation into the new site in 2003, it will be awarded a rate 50% of the maximal rate mentioned above.

3) If the industry finishes its relocation into the new site in 2004, it will be awarded a rate 30% of the maximal rate mentioned above.

The industry can decide by itself how to consume the awarded money. The listed monetary prizes will not be involved in the taxation process of the industry (any type of tax).

The City People's Committee assigns Dept. of Finance to be the coordinator in association with Taxation Bureau, related Dept. and District government in order to study, and then submit the City a proposal for the implementation of the interest

subsidization (compensation), land rental charge compensation (subsidization), investment incentive, tax exemption, etc which are mentioned previously.

The content of this appendix is the temporary policy which aims to encourage and stimulate polluting industries to participate in the industrial relocation programme during 2002-2004. During the implementation of the programme, the Executing Board of the programme with research results of the Finance Team (reviewing financial and policy making aspects) will adjust and modify the policy of the programme in order to make it more appropriate to practical situations of the industries.

Appendix 4: LIST OF INTERVIWEES IN "ASSESSING INDUSTRY RELOCATION PROGRAMME"

No	Interviewee	Organization
1	Vu Tien Thong	Hong Phuc Enterprise
2	Phan Van Hoa	Cong Thanh Enterprise
3	Pham Chan Dong	Tuyet Tran Enterprise
4	Tran Quang	Hiep Thanh Enterprise
5	Tran Thi Ngoc	Phat Thinh Enterprise
6	Mai Van Bay	Cong Thanh Enterprise
7	Nguyen Ngoc Hai	Ngoc Hai Enterprise
8	Nguyen Thi Le	Hung Thinh Enterprise
9	Nguyen Xuan Nhi	Duc Hung Enterprise
10	Le Van Tien	Phuoc Thinh Pte.
11	Manager	Branch No.2 of Xuan Huong Ltd. Company
12	Nguyen Xuan Dung	Viet Phu Enterprise
13	Huynh Van Trieu	Phuoc Thanh Pte.
14	Ly De	Hoang Phong Enterprise
15	Vu Van Thieu	Nam Quang Ltd. Company
16	Ho Sec Nhin	Hoa Ty Ltd. Company
17	Lam Vi Giang	Viet Kien Rubber Enterprise
18	Vo Van Thanh	Toan Cau Enterprise
19	Bui Van Danh	Phuoc Loi Enterprise
20	Thai Ngoc Lan	Chanh Phat Enterprise
21	Phuong Hi Minh	Khai Hoan Enterprise
22	Phan Minh Tan	Department of Science, Technology & Environment (DOSTE)
23	Doan Thi Toi	
24	Tran Nguyen Hien	
25	Ho Minh Hieu	HEPZA
26	Vo Phi Hai	Environmental Group of Tan Binh District
27	Nguyen Gia Hien	Environmental Group of District 11

Appendix 5: LIST OF INTERVIEWEES IN "ASSESSING EoP TREATMENT APPROACH"

No	Name of Enterprise	Type of industry
1	Le An Diem	Plastic grinding
2	Hoang van Suoc	Plastic
3	Vien Ky	Plastic
4	Tran Phuoc	Recycle plastic grinding
5	Kim Ma	Plastic
6	Tin Hung	Assembling of plastically massage tool
7	Nhan Thanh	Plastic
8	Thang Loi	Nylon container
9	Nguyen Hoang Minh	Stopple making
10	Chi Son	Recycle plastic grinding
11	Tan Lien Hung	Recycle PVC
12	Tan Tien	Exhaust pipe of motocycle
13	Hiep Tien	Iron planishing
14	Casting No.1 company	Casting (metal)
15	To Ky	Glass container
16	Vinh An	Domestic glass
17	Tien Phong	Glass
18	Vinh Tien	Molding (iron)
19	Nguyen thi Mui	Recycle plastic thread
20	Thanh Phu	Plastic
21	Lam Quoc Hue	Plastic
22	Tran Dat Minh	Plastic toy
23	Nam Hung	Plastic
24	Hong Ha	Beer
25	Thang Loi	EVA plastic
26	Tan Phu Cuong	Dyeing
27	Viet Phat	Tyre & Tube for motocycle
28	Tan Tai	Wood paint
29	My Ngoc	Malt
30	Phuoc Thanh	Industrial cotton
31	Hai Thanh	Recycle paper
32	Giang Hiep Thanh	PVC pipe
33	Lien Son	Rubber

No	Name of Enterprise	Type of industry
34	Doan Ket	Mousse
35	Dong Nam	EVA mousse
36	Dan Cuong	EVA mousse
37	Lida	Beer
38	Lien A	Mousse mattress
39	Phuoc Thinh	Textile and Dyeing
40	Minh Quoc	Tapioca processing
41	Huong Que	Tapioca processing
42	Hoa Sen	Tapioca processing
43	Hao Hiep	Tapioca processing
44	Ngoc Son	Tapioca processing
45	Phuong Long	Tapioca processing
46	Sang Thu	Tapioca processing
47	Dong Nam	Paper
48	Viet Hung	Rubber glove

No	Name	Organization
1	Ho Trung Hieu	HEPZA
2	Nguyen Khac Thanh	DOSTE
3	Vo Phi Hai	Environmental Group of Tan Binh District
4	Nguyen Gia Hien	Environmental Group of District 11
5	Nguyen Tan Tuyen	Environmental Group of Binh Chanh District
6	Ly Sam	Environmental Group of Hoc Mon District
7	Nguyen Hong Lam	Environmental Group of District 6
8	Vo Van On	Environmental Group of Thu Duc District
9	Lam Minh Triet	Institute of Environment and Resources (IER)
10	Nguyen Thanh Hung	
11	Nguyen Nhu Sang	
12	Nguyen Duy Hau	
13	Vu Pha Hai	
14	Nguyen Phuoc Dan	Polytechnic University of HCMC
15	Pham Trung Kien	Agriculture and Forestry University of HCMC
16	Tran Minh Quoc	Tan Duc Thao waste treatment service company

Appendix 6: LIST OF INTERVIEWEES IN "ASSESSING CLEANER PRODUCTION APPROACH"

No.	Interviewee	Organization
1	Huynh Ngoc Duc	Xuan Duc Paper Shareholding Company
2	Nguyen Minh Tam	Linh Xuan Paper Shareholding Company
3	Nguyen Thanh Phuong	Thien Huong Food Shareholding Company
4	Nguyen thi Hanh	Tan Binh Vegetable Oil Factory
5	Vu Quynh Lan	Thanh Cong Texttile Company
6	Pham thi Than	Sai Gon Texttile Company
7	Nguyen Ngoc An	VISSAN Food Company
8	Nguyen Van Vien	Nhat Tri Ltd. Company (Dyeing)
9	Le Van Phuc	Phuoc Long Texttile Company
10	Vuong Tai	District 8 Export Product Processing State-owned Enterprise
11	Nguyen Ngoc Duy	Tan Thuan Agex Saigon Export Food Processing Enterprise
12	Bui Van Xuan	Gia Dinh Sewing-Textile Company
13	Pham Trung Cang	Tan Dai Hung Ltd. Company (Plastic)
14	Lu Duc Khang	Vinh Thai Ltd. Company (Paper)
15	Nguyen Quoc Tuan	Tuan Hoang Dyeing & Bleaching Enterprise
16	Tran thi Hoa Binh	Cau Tre Export Product Processing State-owned Enterprise
17	Huynh Kim	Mai Lan Paper Company
18	Dang Thanh Hai	Hai Duy Ltd. Company (Industrial Alcohol)
19	Tran Thanh Phuong	Vinh Hue Paper Company
20	Doan Thi Toi	Department of Science, Technology and Environment (DOSTE)
21	Tran Nguyen Hien	
22	Mai Thi Minh Tam	Department of Industry (DOI)
23	Vo Thi Hoai Nam	Department of Finance (DOF)
24	Nguyen Minh Ha	Department of Planning and Investment (DPI)
25	Hoang Dinh Thang	HCMC Investment and Urban Development Fund (HIFU)
26	Dinh The Hien	
27	Tran Huu Thai	

No	Name	Organization
28	Nguyen Thi Truyen	Institute of Environment and Resources (IER)
29	Le Thanh Hai	
30	Nguyen Manh Cuong	
31	Le Hoang Viet	Development and Research Center for Energy Conservation (ENERTEAM)
32	Nguyen Le Truong	
33	Nguyen Thi Tam Lang	Environmental Technology Center (ECO)
34	Nguyen Nhu Dzung	Environmental Protection Center (EPC)
35	Ton That Lang	Environment and Technology Center (ETC)
36	Nguyen Phuoc Dan	Environment Faculty, Polytechnic University in HCMC
37	Vu Ba Minh	
38	Vo Le Phu	
39	Le Manh Quynh	
40	Phan Minh Tan	Independent consultant
41	Le Thi Thanh My	
41	Do Hoang Oanh	

SUMMARY

At the moment small and medium-sized enterprises (SMEs) are an important group of enterprises in Viet Nam as well as in Ho Chi Minh City (HCMC). It is estimated that more than 90% of all private Vietnamese enterprises are SMEs, while 95 % of manufacturing enterprises can be labelled SMEs. Due to their obsolete manufacturing technologies and absence of environmental protection facilities, most SMEs significantly contribute to the pollution in the City, endangering the health of residents and the environment. While environmental policy design and implementation have not focused on SME, HCMC meets various difficulties in implementing environmental policies and measures for the scattered and numerous small and medium-sized enterprises.

Under such circumstances, this research aims to contribute to the improvement of environmental policies towards SMEs in HCMC, through a systematic evaluation of the existing governmental environmental policies and measures, and the development of new feasible, effective and suitable environmental policies for greening the SME sector. In aiming at these objectives the following three questions are given a central place: What have been the effects and the effectiveness of existing pollution control policies towards SMEs in HCMC? Which factors explain the successes and failures of existing environmental policies towards SME? And how can existing environmental policy approaches be improved in order to reduce the environmental impacts of SMEs in HCMC more effectively?

In order to answer these questions, this research relies on three main sources. First, the research builds upon and uses theoretical concepts and ideas of Political Modernization as a source of inspiration and information for developing new ideas of environmental governance in Viet Nam. Second, best practice experiences from various other countries are assessed to learn about effectiveness, successes and failures of different environmental policy approaches for greening SMEs, and that information is used to compare with HCMC experiences and to improve existing and design new policy approaches. But, thirdly, the main emphasis is on a systematic evaluation of existing Vietnamese policy experiences for greening the SME sector in HCMC. For this, an environmental policy evaluation methodology is developed and applied for the analysis of three extensive cases of prominent pollution control approaches: the relocation of polluting enterprises, end-of-pipe treatment approaches and the cleaner production programme.

The three evaluated pollution control programmes have achieved effects in terms of environmental protection and behavioural changes of SMEs. All three programmes show, for at least part of the companies under these programmes, improved environmental performance and reduced pollution levels. While a detailed, quantitative evaluation of the effectiveness of these approaches is not really possible due to a lack of clearly formulated city wide policy objectives and missing data, it seems plausible to claim that the effectiveness would have been limited if fairly ambitious objectives had been formulated clearly. In general, the case studies showed that most SMEs regard environmental protection and pollution control issues as undesired interruptions in their production routines and as additional costs, rather than as potential investment chances and win-win opportunities.

Throughout the three case studies, the single factor that stands out as the one most contributing to success is the strong commitment and interest of the leadership of the City People's Committee. Obviously, in a policy sector in which the state is so dominant, and in a society where the state still has a major influence upon the organization of social, economic and political life, the commitment of the state – now in the role of the City People's Committee – is a crucial factor for success. With respect to the end-of-pipe (EoP) treatment policy, public pressure (from both civil communities and the media) effectively motivates and enhances the environmental enforcement of authorities and as such is a factor for success, especially where control and enforcement activities and capacities of city and district authorities fall short. Regarding the cleaner production (CP) programme an important factor for success relates to the awareness and commitment of the top management of the involved SMEs. In addition, financial support from central and city government as well as from local organizations proves essential, especially for SMEs. For all programmes, the need to 'create a positive public image' of enterprises, the public disclosure of polluters and clean enterprises, as well as further environmental publications in media are factors contributing to the success of environmental policies.

In the three case studies, a major factor contributing to failures has been the lack of consensus and cooperation between state and industry in the establishment and implementation of the investigated policies. Moreover, there is at the moment a lack of institutionalized channels for participation in decision-making processes – both by the public and by private economic sectors - in City environmental management. And at the same time, the role of more general economic organizations, such as sectoral associations or industrial zone organizations, is too unclear and not articulated. In addition, the absence of an effective financial support policy focusing specifically on the (usually resource-poor) SME sector has frustrated the implementation of a number of in principle well designed policy programmes. At the same time, severe understaffing, financial constraints, poor management, inconsistent institutional arrangements as well as insufficient supervision and monitoring by state authorities also contributed to unsuccessful environmental interventions in the City. Finally, a lack of transparency in the implementation process, a lack of accountability of authorities, and a high risk of corruption, seriously jeopardize successful decentralization processes and the building of modern environmental governance in Viet Nam. On the side of enterprises there are also a number of regularly returning factors that affect successful environmental policy implementation of all three programs: the (limited) knowledge, attitude, and commitment of enterprise owners/managers; limited investment possibilities; and high costs.

In light of the research questions, this research can draw the following conclusions on the greening of SMEs in HCMC: (1) most SMEs consider responses to environmental challenges as an additional cost and extra obstacle to their production. Practically none of the enterprises feel that environmentally friendly practices can lead to increased earnings or improved competitiveness, certainly not in the short term; (2) the majority of SMEs are not interested in their environmental performance and will only act on improvements when forced externally; (3) by far the most important reason for adopting pollution control measures are legal and external pressures from authorities and neighbouring residents (and media); economic reasons and increased environmental awareness of managers/owners do not play a significant role yet; (4) current environmental policies, regulations, support programmes, and incentives

(including financial ones) seem not to touch the large majority of SMEs, nor change their production behaviour; (5) most SMEs that are touched by these state policies complain that environmental regulations are rigid and inflexible, and that they are not given sufficient time and financial support to adapt their production methods and products; (6) finally, in conclusion, there is a need for further intensification and improvement of state environmental programmes towards SMEs in HCMC.

This lead to the conclusion that command-and-control approaches will for some time remain an essential part of HCMC environmental policy style. Within that general framework recommendations for a better environmental policy can be formulate along two lines: (i) an improvement of the various policies and measures within the boundaries of a conventional command-and-control framework; and (ii) integrate this conventional approach with several innovative concepts and approaches to improve policy effectiveness and environmental compliance of manufacturing enterprises.

Implementation for relocating SMEs can be improved by better incentives to assist them to overcome the difficulties and disadvantages of relocation, adequate preparation in terms of land planning and infrastructure on relocation sites, and consistent implementation. More intensive and better negotiations with (groups of) enterprises and their sectoral associations is an important strategy that will improve implementation records. If relocation is selected as one of the major strategies in industrial pollution control, an effective environmental management system in IZs is a prerequisite for avoiding “pollution relocation”.

Improvement of the end-of-pipe treatment approaches are strongly related to a more strict enforcement of environmental regulation and standards by the City authorities. Given that, conventional recommendations are still essential: Government authorities must enhance their capacity (staff, resources, equipments, knowledge) for monitoring effluents and emissions of SMEs, for ensuring good compliance, as well as for establishing and implementing a reasonable pollution discharge fee system. Additional pressure might be put on SMEs via a better inventory of pollution sources, a better disclosure of these sources to neighbouring communities and the media, and adequate reactions of state authorities towards community complaints and monitoring. This is also related to the expectations and preferences of enterprises for a stable, consistent and predictable policy implementation.

Cleaner production can be a promising approach for SMEs, also in HCMC, in terms of both economic efficiency and environmental effectiveness. The most important factor to successfully adopt cleaner technologies, management and organizational measures is the motivation and involvement of, and the commitment from, the management of SMEs. Authorities should assist SMEs in taking away the constraints in cleaner production implementation, and at the same time set conditions that push SMEs towards cleaner production options. Central and City governments can do this by formulating, financing and coordinating cleaner production policies, projects and facilities and by institutionalizing cleaner production policies via promotion, cooperation, and consultation with SMEs. Here is a typical case where strict rules and enforcements have to go along with cooperation and negotiations. There are still numerous possibilities in other policy areas (taxation, technology development, export promotion, etc) to stimulate SMEs to be more active in implementing cleaner production.

A number of recommendations for greening SMEs can also be related to the actors involved: The state and state authorities, the SMEs and social communities.

With respect to state authorities four main recommendations are formulated: State capacity building, institutional reform, working with negotiated agreements in combination with conventional policy styles, and financial incentives.

With respect to SMEs the introduction of environmental management systems (EMS) is a key recommendation. Similar to CP adoption, however, resource limitations are constraining EMS introduction. Unless an EMS certification is needed to satisfy the requirement of international trade, recommendations for EMS introduction at SMEs seems to be an unrealistic challenge for most SMEs in HCMC.

Communities and civil society should be given the opportunity to play a larger role in SME environmental policies. Two recommendations are central: Information disclosure and public participation. The City government should facilitate, enable and support both by systematically institutionalizing community participation, widely distributing environmental information and effectively developing awareness programmes and campaigns.

SAMENVATTING

Middelgrote en kleine bedrijven (MKB's) vormen op het moment een belangrijke groep ondernemingen in Vietnam en in Ho Chi Minh Stad (HCMS). Naar schatting behoort meer dan 90 % van alle private ondernemingen in Vietnam tot de groep van de MKB's, terwijl 95 % van de industriële ondernemingen tot de MKB's gerekend kan worden. Vanwege hun ouderwetse productiemethoden en de afwezigheid van milieubeschermende maatregelen dragen de meeste MKB's significant bij aan de vervuiling in de stad. Ook vormen zij een gevaar voor de gezondheid van de inwoners en voor het milieu. Bij de ontwikkeling en uitvoering van het milieubeleid was tot nu toe weinig aandacht voor MKB's. Momenteel wordt HCMS dan ook geconfronteerd met verschillende moeilijkheden bij het uitvoeren van milieubeleid en van milieumaatregelen voor de verspreid liggende en talrijke MKB's.

Onder deze omstandigheden stelt het onderhavige onderzoek zich ten doel bij te dragen aan het verbeteren van milieubeleidsmaatregelen ten aanzien van MKB's in HCMS door een systematische evaluatie van bestaand milieubeleid en bestaande milieumaatregelen van de overheid, en het ontwikkelen van nieuwe, uitvoerbare, effectieve en gepaste milieubeleidsmaatregelen ter vergroening van de MKB sector. Om deze doelstellingen te verwezenlijken stelt dit onderzoek de volgende drie vragen centraal: Wat waren de effecten van bestaande, op MKB's gerichte, vervuilingbeperkende beleidsmaatregelen in HCMS, en hoe effectief waren ze? Welke factoren verklaren de successen en mislukkingen ten aanzien van bestaande milieubeleidsmaatregelen gericht op MKB's? En hoe kan dit milieubeleid worden verbeterd opdat de milieudruk door MKB's in HCMS op meer effectieve wijze wordt verkleind?

Om deze vragen te beantwoorden maakt dit onderzoek gebruik van drie bronnen. Om te beginnen bouwt het onderzoek voort op en maakt het gebruik van theoretische concepten en ideeën van Politieke Modernisering, als inspiratie- en informatiebron voor het ontwikkelen van nieuwe ideeën ten aanzien van het milieubeheer in Vietnam. Ten tweede worden de 'best practices' van verschillende andere landen geanalyseerd om meer te weten te komen over de effectiviteit, de successen en de mislukkingen van verschillende milieubeleidbenaderingen ter vergroening van MKB's. Deze informatie vormt vergelijkingsmateriaal voor de ervaringen in HCMS, en wordt daarnaast gebruikt om bestaande benaderingen te verbeteren en nieuwe te ontwikkelen. In het onderzoek ligt echter de grootste nadruk op een systematische evaluatie van Vietnamese ervaringen met het beleid voor vergroening van de MKB sector in HCMS. Hiertoe wordt een methodologie voor milieubeleidevaluatie ontwikkeld welke wordt gebruikt voor de analyse van drie grootschalige case studies waarin belangrijke vervuilingbeperkende benaderingen zijn toegepast. Deze drie benaderingen zijn het verhuizen van vervuilende bedrijven; de 'end-of-pipe' benadering; en de 'cleaner production' benadering.

De drie geanalyseerde vervuilingbeperkende programma's hebben geleid tot effecten in termen van milieubescherming en gedragsveranderingen bij MKB's. Alle drie de benaderingen laten, in ieder geval bij een deel van de bedrijven die deel uitmaakten van deze programma's, een verbetering van de milieuprestatie en gereduceerde vervuilingniveaus zien. Het is niet mogelijk een gedetailleerde kwantitatieve evaluatie

van deze benaderingen te geven, vanwege een gebrek aan duidelijk geformuleerde, voor de gehele stad geldende, beleidsdoelstellingen en vanwege een gebrek aan gegevens. Toch lijkt het aannemelijk om te stellen dat de effectiviteit van deze benaderingen gering zou zijn geweest als er al te ambitieuze, duidelijk geformuleerde, doelstellingen waren geweest. Over het algemeen lieten de case studies zien dat de meeste MKB's milieubescherming en vervuilingbeperkende maatregelen beschouwen als ongewenste interrupties in hun productie routines en als bijkomende kosten, in plaats van als potentiële kansen voor investeringen en mogelijkheden voor 'win-win' situaties.

Over de gehele linie, bij alle drie de case studies, is gebleken dat de grote betrokkenheid en het enthousiasme van de leiders van de 'City People's Committee' de belangrijkste succesfactor is geweest. Het is overduidelijk dat de betrokkenheid van de staat – nu in haar hoedanigheid van 'City People's Committee' - een cruciale factor is, zeker voor een beleidsterrein waarin de staat zo dominant is, en zeker voor een samenleving waarin de invloed van de staat op het sociale, economische en politieke leven zo groot is. Ten aanzien van het 'End-Of-Pipe' (EOP) beleid is gebleken dat publieke druk (zowel van burger groeperingen als van de media) autoriteiten motiveert om hun milieuslagkracht te vergroten en dat deze publieke druk ook daadwerkelijk bijdraagt aan een vergrote slagkracht. Dit is een succesfactor op zich, zeker wanneer stads- en districtsautoriteiten te weinig activiteiten ten aanzien van controle en dwang ontplooien en hier ook niet de capaciteiten voor hebben. Met betrekking tot het 'Cleaner Production' (CP) programma was een belangrijke succesfactor dat het topmanagement van de betrokken MKB's bekend was met het onderwerp en zich erbij betrokken voelde. Bovendien was het voornamelijk voor MKB's belangrijk dat zij financiële steun kregen van de centrale overheid, het stadsbestuur en van locale organisaties. Bij alle programma's waren de noodzaak tot 'het creëren van een positief beeld – van bedrijven – naar buiten toe', het publiekelijk benoemen van vervuilende en schone bedrijven, en de aanwezigheid van milieu publicaties in de media factoren die bijdroegen aan het succes van het milieubeleid.

Een belangrijke faalfactor bij de drie case studies was het gebrek aan consensus en samenwerking tussen staat en industrie bij het bewerkstelligen en uitvoeren van de onderzochte beleidsmaatregelen. Bovendien is er op het moment een gebrek aan geïnstitutionaliseerde kanalen voor participatie – door publieke en door private economische sectoren – in de besluitvormingsprocessen ten aanzien van het milieubeheer van de stad. Tegelijkertijd is de rol van meer algemene economische organisaties, zoals sectorale groeperingen en gebiedsspecifieke organisaties, te onduidelijk en wordt deze rol ook niet expliciet benoemd. Daar komt bij dat de uitvoering van – in principe goed doordachte - beleidsprogramma's wordt bemoeilijkt doordat een effectief financieel ondersteuningsbeleid, speciaal gericht op de MKB sector die normaalgesproken weinig hulpbronnen ter beschikking heeft, afwezig was. Ook ernstige onderbezetting, financiële beperkingen, slecht beheer, inconsistente institutionele arrangementen en onvoldoende begeleiding en controle door staatslichamen droegen bij aan falende milieu-interventies in de stad. Ten slotte frustreerden een gebrek aan transparantie bij de uitvoering, een gebrek aan aansprakelijkheid van autoriteiten en een hoog risico op corruptie succesvolle decentralisatie processen en het opbouwen van modern milieubeheer in Vietnam in belangrijke mate. Aan de kant van de bedrijven zijn er ook een aantal regelmatig terugkerende factoren die een succesvolle uitvoering van het milieubeleid – bij alle

drie de onderzochte programma's – in de weg staan. Deze factoren zijn de (beperkte) kennis, houding, en betrokkenheid van de eigenaren/bestuurders van ondernemingen; beperkte investeringsmogelijkheden; en hoge kosten.

In het licht van de onderzoeksvragen trekt dit onderzoek de volgende conclusies met betrekking tot de vergroening van MKB's in HCMS: (1) de meeste MKB's zien ' rekening houden met milieu uitdagingen' als een extra kostenpost en een obstakel voor hun productie. Praktisch geen enkel bedrijf heeft het gevoel dat milieuvriendelijke processen kunnen leiden tot hogere inkomsten of grotere competitiviteit, zeker niet op korte termijn; (2) de meerderheid van de MKB's zijn niet geïnteresseerd in hun milieuprestatie en zullen enkel werk maken van verbeteringen als gevolg van externe druk; (3) verreweg de belangrijkste reden voor het toepassen van vervuilingbeperkende maatregelen zijn wettelijke en externe druk van de autoriteiten en van naburige inwoners (en de media); economische redenen en een grotere bekendheid van bestuurders/eigenaren spelen nog geen significante rol; (4) de overgrote meerderheid van de MKB's lijken niet geraakt te worden door de huidige beleidsmaatregelen, regulering, ondersteuningsprogramma's, en stimulansen (inclusief de financiële); ook leiden zij niet tot veranderde productieprocessen; (5) de meeste MKB's die met staatsinterventies worden geconfronteerd klagen dat milieuregels rigide en weinig flexibel zijn, en dat er te weinig tijd en financiële ondersteuning voorhanden is om hun producten en productieprocessen aan te passen; (6) tenslotte is het nodig dat de milieuprogramma's van de staat ten aanzien van MKB's in HCMS verder worden geïntensiveerd en verbeterd.

Dit leidt tot de conclusie dat 'Command-And-Control' benaderingen voorlopig een essentieel onderdeel van het milieubeleid in HCMS zullen blijven. De formulering van suggesties voor verbetering van het milieubeleid dient dan ook via twee sporen te worden geformuleerd. Enerzijds door verbetering van het beleid en van beleidsmaatregelen binnen de grenzen van een conventioneel 'Command-And-Control' raamwerk. Anderzijds door integratie van deze conventionele benadering met verschillende innovatieve concepten en benaderingen die kunnen leiden tot effectiever beleid en die industriële ondernemingen aan milieueisen laten voldoen.

Het beleid van het verplaatsen van MKB's kan verbeterd worden door het toepassen van stimulansen om deze bedrijven te helpen bij het beteugelen van de moeilijkheden en nadelen van verplaatsing, adequate voorbereiding in termen van landgebruikplanning en infrastructuur op de verplaatsingslocaties en consistente uitvoering. Intensievere en betere onderhandelingen met (groepen) ondernemingen en hun sectorale belangenorganisaties vormen een belangrijke strategie die de kwaliteit van de uitvoering ten goede zal komen. Wanneer verplaatsing wordt geselecteerd als een van de belangrijkste strategieën bij het tegengaan van industriële vervuiling is een effectief milieuzorg systeem voor industriegebieden een eerste vereiste om 'verplaatsing van de vervuiling' te voorkomen.

Verbetering van 'End-Of-Pipe' methoden is sterk gerelateerd aan het strikter afdwingen van milieuregels en standaarden door het stadsbestuur. Dat gezegd zijnde zijn conventionele aanbevelingen nog steeds essentieel: overheidslichamen moeten hun capaciteit (in termen van mensen, middelen, materialen en kennis) vergroten. Deze capaciteit is nodig voor het monitoren van effluenten en emissies van MKB's, voor het afdwingen van goede naleving en voor het opzetten en uitvoeren van een

billijk systeem voor het in rekening brengen van de uitstoot van vervuiling. De druk op MKB's zou verhoogd kunnen worden door de vervuilingsbronnen beter in kaart te brengen, deze bronnen beter bij naburige gemeenschappen en de media onder de aandacht te brengen en door adequate reacties van staatsautoriteiten ten aanzien van klachten van de gemeenschap. Dit raakt ook aan de verwachtingen en voorkeuren van ondernemingen ten aanzien van een stabiele, consistente en voorspelbare uitvoering van het beleid.

'Cleaner Production' is mogelijk ook een veelbelovende benadering voor MKB's, ook in HCMS, zowel in termen van economische efficiëntie en milieu effectiviteit. De belangrijkste factor om schone technologieën, management en organisatorische maatregelen op succesvolle wijze toe te passen is de motivatie, betrokkenheid en toewijding van het bestuur van MKB's. Autoriteiten moeten MKB's helpen bij het wegnemen van de beperkingen bij het uitvoeren van schonere productie methoden en tegelijkertijd de randvoorwaarden scheppen waardoor MKB's in de richting van schone productie opties worden gepusht. De centrale overheid en het stadsbestuur kunnen dit doen door het formuleren, financieren en coördineren van beleidsmaatregelen ten aanzien van schone productie, projecten en faciliteiten, en door de institutionalisering van het schone productie beleid door middel van promotie, samenwerking en overleg met MKB's. Dit is een typisch geval waarin strikte regelgeving en dwang gecombineerd moet worden met samenwerking en onderhandeling. Er zijn nog steeds talrijke mogelijkheden in andere beleidsterreinen (belastingen, ontwikkeling van technologie, vergroten van de export etc.) om MKB's te stimuleren zich bij het uitvoeren van schone productie actiever op te stellen.

Een aantal aanbevelingen voor de vergroening van MKB's kan ook worden gerelateerd aan de betrokken actoren: de staat en staatsautoriteiten, de MKB's en sociale gemeenschappen.

Met betrekking tot staatsautoriteiten kunnen vier kern aanbevelingen worden geformuleerd: het vergroten van de capaciteit van de staat, institutionele hervormingen, het toepassen van onderhandelde overeenkomsten in combinatie met conventionele beleidsmethodieken, en financiële stimulansen.

Ten aanzien van de MKB's is het introduceren van milieuzorgsystemen een kern aanbeveling. Echter, evenals bij het toepassen van schone productie, wordt de introductie van milieuzorgsystemen belemmerd door het beperkt zijn van de hulpbronnen. Tenzij milieuzorg certificering noodzakelijk is om te voldoen aan de vereisten van internationale handel lijkt de introductie van milieuzorgsystemen voor MKB's een weinig realistische optie voor de MKB's in HCMS.

Gemeenschappen en het maatschappelijke middenveld moeten de mogelijkheid krijgen een grotere rol te spelen in het milieubeleid ten aanzien van MKB's. Twee aanbevelingen staan centraal: het toegankelijk maken van informatie, en publieke participatie. Het stadsbestuur dient dit te faciliteren, dit mogelijk te maken en te ondersteunen, zowel door op systematische wijze participatie van de gemeenschap te institutionaliseren als door het ruimschoots verspreiden van milieu informatie en het effectief ontwikkelen van bewustwordingsprogramma's en campagnes.

TÓM TẮT

Hiện nay các xí nghiệp vừa và nhỏ (XNV&N) là nhóm xí nghiệp quan trọng ở Việt Nam cũng như ở thành phố Hồ Chí Minh (TP.HCM). Khoảng hơn 90% xí nghiệp tư nhân ở Việt Nam là XNV&N, trong khi 95% các xí nghiệp sản xuất là XNV&N. Do công nghệ sản xuất lạc hậu và thiếu vắng các phương tiện bảo vệ môi trường, hầu hết các XNV&N đóng góp đáng kể vào hiện trạng ô nhiễm của Thành phố, đe dọa sức khoẻ người dân và chất lượng môi trường. Trong khi việc xây dựng và thực hiện các chính sách môi trường không tập trung vào XNV&N, TP.HCM đang gặp nhiều khó khăn trong việc thực hiện các chính sách và giải pháp môi trường cho các XNV&N đông đảo và phân tán như thế.

Trong bối cảnh đó, nghiên cứu này nhắm đến việc cải thiện những chính sách môi trường hướng đến XNV&N tại TP.HCM, thông qua việc đánh giá một cách hệ thống những chính sách và giải pháp môi trường hiện hữu của chính phủ, và phát triển những chính sách môi trường khả thi, hiệu quả và phù hợp cho việc 'xanh hoá' khu vực XNV&N. Tương ứng những mục tiêu trên, ba câu hỏi chính được đặt ra như sau: Tác động và hiệu quả của những chính sách kiểm soát ô nhiễm hiện hữu hướng đến XNV&N tại TP.HCM là gì? Những yếu tố nào giải thích cho thành công và thất bại của những chính sách môi trường hiện hữu? Và những chính sách môi trường này cần được cải thiện như thế nào để hiệu quả hơn?

Để trả lời các câu hỏi trên, việc nghiên cứu dựa trên ba nguồn chính. Thứ nhất, việc nghiên cứu dựa vào và sử dụng các khái niệm và ý tưởng của lý thuyết Hiện đại hoá chính trị (Political Modernization) như một nguồn cảm hứng và thông tin cho việc phát triển những ý tưởng mới trong việc quản lý môi trường ở Việt Nam. Thứ hai, tiếp cận những kinh nghiệm thực tế tốt nhất từ những quốc gia khác nhau để hiểu rõ về hiệu quả, thành công và thất bại của các chính sách môi trường khác nhau cho việc xanh hoá XNV&N và để so sánh với thực tế tại TP.HCM nhằm cải thiện chính sách hiện hữu và xây dựng chính sách mới. Thứ ba, từ việc nhấn mạnh chính dựa trên việc đánh giá một cách hệ thống những kinh nghiệm chính sách hiện hữu của Việt Nam cho việc xanh hoá khu vực XNV&N tại TP.HCM, một phương pháp luận đánh giá chính sách môi trường được phát triển và áp dụng để phân tích ba trường hợp điển hình của những giải pháp kiểm soát ô nhiễm tại TP.HCM: Chương trình di dời xí nghiệp ô nhiễm, giải pháp xử lý cuối nguồn (EoP) và chương trình sản xuất sạch hơn (CP).

Qua đánh giá, ba chương trình kiểm soát ô nhiễm trên đã có những tác động nhất định đến việc bảo vệ môi trường và thay đổi hành vi của các XNV&N. Cả ba chương trình đều cho thấy, có một số xí nghiệp liên quan trong phạm vi ba chương trình đã cải thiện việc tuân thủ môi trường và giảm mức ô nhiễm của họ. Việc đánh giá chi tiết và định lượng về hiệu quả của ba chương trình không thực sự khả thi do mục tiêu của các chính sách Thành phố không được xây dựng rõ ràng và do dữ liệu, thông tin không đầy đủ, dường như hợp lý khi cho rằng tính hiệu quả bị hạn chế khi người ta đề ra các mục tiêu tương đối tham vọng. Nhìn chung, qua các nghiên cứu điển hình cho thấy hầu hết XNV&N xem vấn đề bảo vệ môi trường và kiểm soát ô nhiễm như là những can thiệp không mong muốn vào hoạt động sản xuất thường nhật của họ và là những chi phí phát sinh hơn là những cơ hội đầu tư tiềm năng hoặc là những giải pháp hai bên cùng có lợi.

Thông qua ba trường hợp điển hình trên, một yếu tố nổi lên như một đóng góp quan trọng nhất vào thành công chính là mối quan tâm và cam kết mạnh mẽ của lãnh đạo Thành phố. Rõ ràng trong một khu vực chính sách mà ở đó nhà nước chi phối quá nhiều, và trong một xã hội mà nhà nước vẫn có ảnh hưởng chính đến cơ cấu của đời sống xã hội, kinh tế và chính trị, sự cam kết của chính quyền – hiện nay là vai trò của Ủy ban Nhân dân Thành phố - là yếu tố quyết định cho sự thành công. Đối với chính sách xử lý cuối nguồn, áp lực cộng đồng (từ cả cộng đồng người dân và báo đài) động viên và thúc đẩy hiệu quả việc cưỡng chế môi trường của chính quyền và do vậy là một yếu tố đóng góp cho sự thành công, đặc biệt tại những nơi mà hoạt động và năng lực kiểm soát và cưỡng chế của chính quyền thành phố và quận/huyện còn hạn chế. Đối với chương trình sản xuất sạch hơn, một yếu tố quan trọng cho việc thành công liên quan đến nhận thức và cam kết của lãnh đạo XNV&N liên quan. Thêm vào đó, hỗ trợ tài chánh từ chính quyền Trung ương và Thành phố cũng như các tổ chức địa phương chứng tỏ là cần thiết, đặc biệt đối với các XNV&N. Cho tất cả các chương trình, nhu cầu tạo nên một hình ảnh tích cực trong mắt cộng đồng của các doanh nghiệp, việc phổ biến cộng đồng những thông tin về các xí nghiệp gây ô nhiễm và các xí nghiệp thân thiện môi trường, cũng như việc công bố những tin tức liên quan đến môi trường trên báo đài là những yếu tố khác đóng góp đến thành công của các chính sách môi trường.

Trong ba trường hợp nghiên cứu trên, một yếu tố quan trọng góp phần vào thất bại chính là thiếu vắng sự nhất trí và hợp tác giữa nhà nước và các xí nghiệp trong việc xây dựng và thực hiện những chính sách môi trường được khảo sát. Thêm vào đó, trong thời điểm hiện tại, vẫn thiếu một cơ chế để cộng đồng và khu vực kinh tế tư nhân tham gia vào các quá trình ra quyết định trong quản lý môi trường của Thành phố. Đồng thời, vai trò của các tổ chức kinh tế rộng lớn hơn như các hiệp hội ngành nghề hoặc các khu công nghiệp không rõ ràng và cụ thể. Bên cạnh đó, sự thiếu vắng một chính sách hỗ trợ tài chính hiệu quả tập trung đặc biệt vào khu vực XNV&N yếu kém tài lực đã làm hỏng việc thực thi một số chương trình chính sách được thiết kế tốt. Cùng lúc đó, việc thiếu hụt cán bộ, những hạn chế tài chính, quản lý kém, sắp xếp thể chế không chặt chẽ cũng như việc giám sát và quan trắc không đầy đủ của chính quyền các cấp cũng đã đóng góp vào thất bại của những can thiệp môi trường tại Thành phố. Cuối cùng sự thiếu minh bạch trong quá trình thực hiện, thiếu trách nhiệm của các quan chức, và nguy cơ cao của tình trạng tham nhũng gây nguy hại nghiêm trọng đến tiến trình phân quyền thành công và quản lý nhà nước về môi trường hiện đại ở Việt Nam. Về phiá xí nghiệp, cũng có một số các yếu tố nội tại tác động đến việc thực hiện thành công các chính sách môi trường của cả ba chương trình: thiếu kiến thức, thái độ và cam kết của giới chủ hoặc lãnh đạo xí nghiệp; khả năng đầu tư giới hạn; và chi phí cao.

Trên cơ sở những câu hỏi nghiên cứu, luận án này đã rút ra những kết luận về việc xanh hóa XNV&N tại TP.HCM như sau: (1) Hầu hết XNV&N xem việc đáp ứng những thách thức môi trường như là chi phí phát sinh và gây khó thêm vào hoạt động sản xuất của họ; đặc biệt không một xí nghiệp nào cảm thấy những hoạt động thân thiện môi trường có thể đem lại nhiều lợi nhuận hơn hoặc làm tăng tính cạnh tranh của họ, ít ra trong giai đoạn trước mắt; (2) đa phần các XVN&N không quan tâm đến trách nhiệm bảo vệ môi trường của họ và chỉ thực hiện điều này khi chịu áp lực bên ngòai; (3) cho đến nay lý do quan trọng nhất để thực hiện các giải pháp kiểm sóat ô nhiễm là những áp lực luật pháp và bên ngòai từ chính quyền và cư dân xung quanh (và báo đài), trong khi yếu tố kinh tế và nhận thức môi trường của chủ doanh nghiệp

hoặc người quản lý chưa đóng vai trò quan trọng; (4) chính sách môi trường hiện hữu, những quy định, chương trình hỗ trợ và những khuyến khích (bao gồm tài chính) dường như chưa đụng chạm đến phần lớn XNV&N cũng như chưa làm thay đổi hành vi sản xuất của họ; (5) hầu hết XNV&N nơi tiếp cận những chính sách nhà nước than phiền quy định môi trường thường cứng nhắc và không linh động, và họ không có đủ thời gian và hỗ trợ tài chính cần thiết để thay đổi phương pháp sản xuất và sản phẩm phù hợp; (6) cuối cùng, cần tăng cường và cải thiện hơn những chương trình môi trường nhà nước hướng đến XNV&N tại TP.HCM.

Có thể kết luận rằng phương thức ra lệnh và kiểm soát vẫn là một phần cần thiết trong mô hình chính sách quản lý môi trường của Thành phố. Đề xuất tổng quát cho một chính sách môi trường tốt hơn có thể theo hai hướng: (i) cải thiện những chính sách và biện pháp khác nhau trong khuôn khổ phương thức ra lệnh và kiểm sóat; và (ii) gắn kết phương pháp truyền thống này với một số khái niệm và phương pháp cách tân để cải thiện tính hiệu quả chính sách và cải thiện việc tuân thủ môi trường của các xí nghiệp sản xuất.

Việc thực hiện di dời những XNV&N ô nhiễm có thể được cải thiện bởi những khuyến khích tốt hơn để hỗ trợ họ vượt qua những khó khăn và bất lợi của việc di dời, bởi việc chuẩn bị quy hoạch đất và hạ tầng đầy đủ tại nơi di dời, và bởi tổ chức chặt chẽ việc thực hiện. Những thương thuyết tăng cường và tốt hơn với những nhóm xí nghiệp và những hiệp hội ngành của họ là một chiến lược quan trọng giúp cải thiện kết quả thực hiện. Nếu di dời được chọn như một chiến lược môi trường quan trọng trong việc kiểm sóat ô nhiễm công nghiệp, một hệ thống quản lý môi trường (EMS) hiệu quả trong các khu công nghiệp là tiền đề cần thiết để tránh "di dời ô nhiễm".

Cải thiện phương thức xử lý cuối nguồn gắn chặt với việc cưỡng chế nghiêm ngặt hơn những quy định và tiêu chuẩn môi trường bởi chính quyền Thành phố. Xét đến điều đó, những đề xuất truyền thống vẫn cần thiết: Các cơ quan chức năng chính quyền phải nâng cao năng lực của họ (cán bộ, tài lực, thiết bị, kiến thức) để quan trắc dòng phát thải của XNV&N, để đảm bảo tốt sự tuân thủ, cũng như để thiết lập và thực hiện hệ thống phí xả thải ô nhiễm hợp lý. Áp lực thêm vào các XNV&N là công tác thống kê nguồn ô nhiễm chính xác hơn, phổ biến tốt hơn những thông tin này đến cộng đồng xung quanh và báo đài, và những phản ứng đầy đủ của chính quyền hướng đến những khiếu nại và giám sát cộng đồng. Điều này cũng liên quan đến sự trông đợi của các xí nghiệp về việc thực hiện chính sách một cách ổn định, chặt chẽ và tiên đóan được.

Sản xuất sạch hơn có thể là một phương thức hứa hẹn cho các XNV&N ở TP.HCM cả về hiệu suất kinh tế lẫn hiệu quả môi trường. Yếu tố quan trọng nhất để ban hành thành công những giải pháp công nghệ, quản lý và tổ chức sản xuất sạch hơn là động cơ, mức độ liên quan và cam kết của lãnh đạo xí nghiệp. Chính quyền nên giúp XNV&N trút bỏ những trở ngại trong việc thực hiện sản xuất sạch hơn và đồng thời đặt ra những điều kiện hướng XNV&N đến các giải pháp sản xuất sạch hơn. Chính quyền Trung Ương và Thành phố có thể làm điều này bởi việc tạo lập, hỗ trợ tài chính và điều phối các chính sách, dự án và phương tiện sản xuất sạch hơn và bởi thể chế hóa chính sách sản xuất sạch hơn theo hướng khuyến khích, hợp tác và tư vấn cho XNV&N. Và đây chính là trường hợp tiêu biểu nơi mà những luật lệ và cưỡng chế nghiêm ngặt phải đi cùng với hợp tác và thương thảo. Vẫn có nhiều giải pháp khả thi trong các lĩnh vực chính sách khác (thuế, phát triển công nghệ, đẩy mạnh xuất

khẩu,…) để khuyến khích XNV&N tích cực hơn trong việc thực hiện sản xuất sạch hơn.

Những đề xuất cho việc xanh hóa XNV&N cũng liên quan đến các chủ thể: Nhà nước và chính quyền, các XNV&N và cộng đồng xã hội.

Đối với chính quyền bốn đề nghị sau được đưa ra: Xây dựng năng lực nhà nước, cải tạo thể chế, thực hiện các hợp đồng thương thảo kết hợp với các mô hình chính sách truyền thống và thực hiện những đòn bẩy tài chính.

Đối với XNV&N việc áp dụng những hệ thống quản lý môi trường (EMS) có thể là đề xuất chính. Tuy nhiên tương tự giải pháp sản xuất sạch hơn, những giới hạn về tài lực đang hạn chế việc ứng dụng EMS. Trừ phi một giấy chứng nhận EMS cần thiết để đáp ứng những yêu cầu thương mại quốc tế, hiện nay những đề xuất cho việc áp dụng EMS trong XNV&N dường như là một thách thức phi thực tế cho hầu hết XNV&N tại TP.HCM.

Cộng đồng và xã hội dân sự nên được cho cơ hội để đóng vai trò lớn hơn trong những chính sách môi trường XNV&N. Hai đề xuất chính: phổ biến thông tin và tham dự cộng đồng. Chính quyền Thành phố nên tạo điều kiện thuận lợi và hỗ trợ bởi thể chế hóa một cách có hệ thống việc tham dự của cộng đồng, phổ biến rộng rãi các thông tin môi trường và triển khai hiệu quả những chương trình và chiến dịch nâng cao nhận thức.