

# **Environmental Considerations and Business Operations of Commercial Banks in China**

- A case Study of the Project Loan Appraisal Policy of ICBC

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Thesis for the fulfilment of the  
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## **Abstract**

Commercial banks in China, such as the Industrial and Commercial Bank of China (ICBC) should take environmental considerations into their business operations and policies to “green” their business, from the perspective of risk management and business marketing. This is not only the social responsibility for them as a corporate citizen which is playing an important role in the business life, but also the expectations from the stakeholders for them to meet the vision and responsibilities of sustainable development.

Environmental issues associated with the industry could influence the commercial banks when environmental risks have been converted into economic risks; but the commercial banks can also benefit from the business opportunities created by environmental issues. But ICBC, due to lacking of environmental considerations incorporated into its project loan policy and lacking of support of tools and knowledge, is exposed to environmental risks and is losing the business opportunities generated through environmental issues.

In this thesis, the author explores how environmental risks could be converted into economic risks and how they influence the banking business and what the opportunities are for commercial banks to incorporate environmental considerations into their business operations and policy development. The aim is to raise the awareness of the top management of ICBC by illustrating how ICBC is exposed to environmental risks and is losing business opportunities. In conclusion, the author proposes a framework for ICBC’s future loan policy.

## Executive Summary

The purpose of this thesis is to raise ICBC's top management's awareness of environmental issues in their business operation and policy-making, within the context of calling for sustainable development and corporate social responsibilities. The author tried to achieve this goal by analyzing ICBC's project loan policy and the potential risks or losses it may have to face due to its possible problems.

The realization of the vision of sustainable development requires changes in mentality and the way of thinking and behaving. Shared responsibility and public participation are essential. Those inputs should be integrated into policy-making and business operations.

Organization in a fast changing environment cannot stop at fulfilling the needs of individuals by providing products or services. They have to meet various stakeholders' needs and expectations to contribute to the society where they are operating their business. They are expected to take their responsibility seriously as corporate citizens to reduce the adverse environmental impacts related to their products and activities. The organizations have recognised this pressure and are making efforts to "green" their businesses, by doing activities such as investing in CP projects or technologies.

Commercial banks have a special position in business life. Their loan business is the principal source of finance of the industry. The money creation and allocation function have far-reaching influence on the industry. The public and the banking sector itself have recognized this. Some commercial banks are making efforts to take their corporate social responsibility to "green" their business.

ICBC is the largest commercial bank in China, and has close relationship with the industry. Its project loan business takes a large proportion of its total loan business and has great influence on the industry in China. A study was performed to review its project loan appraisal policy to determine whether it has environmental considerations incorporated and whether it is in line with the vision of sustainable development.

Environmental issues caused by the lack of consciousness of negative impacts of human activities, such as water pollution, air pollution, solid waste and hazardous waste, soil and groundwater contamination, and negative human health effects. The recognition of these issues by the government has led to and will lead to legislation on environmental issues; the public concern will change the public's perception and value of and attitude towards environmental issues.

Currently the environmental situation in China is considered to be serious. The Chinese authorities have taken measures to solve the problems and made some progress. But the trend of the future changes of China's environmental policy is expected to be frequent and it will become more stringent. The legislation and its enforcement will be enhanced and more economic instruments will be employed. Many Chinese companies are not ready for this trend.

All these new policies will change the environment of the business, such as the legal environment, the market environment and the social environment, which may cause financial or reputation losses for the companies. The likelihood of financial or reputation losses to the industry and to the lending banks that was caused by environmental and environmentally relevant issues is defined as environmental risks.

Environmental risks can be converted into economic risks in various circumstances. Environmental regulations or requirements may cause clean-up costs, conversion costs or environmental damage liabilities to the companies. To meet higher standards or more stringent legislation, the companies have to invest in new equipment and techniques. Soil clean-up is costly and time consuming. The environmental concerns may lead to market changes and hence may influence the material supply and sale of products or market shares; competitor's environmental strategy changes may also threaten those that have not introduced environmentally responsible policies and procedures. Accidents may lead to financial and environmental losses, adverse human health consequences or even life loss. Reputation loss related to environmental issues may lead to brand erosion, criminal liability or boycotts. Long-term environmental issues such as global warming and climate change also have negative financial influences on the companies, which comes from the environmental issues themselves or from the exposure to legislation designed to mitigate the greenhouse emissions. Several case studies were employed to illustrate the above-mentioned circumstances.

When the environmental risks have occurred, the lending banks have to document and quantify the cost increases, additional investments, loss of sales and legal liabilities that may lead to decreases of the borrowers' cash flow and hence may influence their repayment capacity. The environmental issues or changed standards or regulations may lead to decreases of the collateral value. Sometimes the commercial banks may suffer from reputation losses due to the adverse environmental impacts of the projects they have financed.

But when the commercial banks take environmental issues into consideration, they also benefit a lot. When the environmental risks are identified and quantified, with the aid of tools like Environmental Impact Assessments and Environmental Risk Assessments, commercial banks can take measures to avoid and manage these risks. By communicating the results of EIAs and ERAs to the customer to help them improve their environmental management, the risks can be minimized from the starting point. All these will help the commercial banks enhance their risk management system.

Environmental issues also created a lot of business opportunities for commercial banks. Environmental protection has been developed to a new economic sector which is a new income source for commercial banks. The demand for investment in environmentally sound technologies and projects provide a platform for commercial banks to develop new environmentally sound business, such as financing CP projects or programs. International financial institutions like World Bank and ADB have a lot of business in developing countries to help them solve the environmental problems they are facing or to face in the future. This provides opportunities for commercial banks to develop their intermediary business. When environmental considerations are incorporated into the advisory business, commercial banks can use their special position to influence their customers to invest in environmentally friendly projects or technologies, such as CP, which can both, benefit the company and the banks. A successful CP investment case is included in this thesis to illustrate this fact.

Due to the lack— of policies that incorporate environmental considerations, ICBC is exposed to the potential risks related to environmental issues. Literature review and qualitative analysis of environmental issues with simple parameters and descriptions cannot fully reveal the potential environmental risks in the project loan assessment. Without proactive policies and tools, the current policies and business operations of ICBC are comparatively resistant to future changes of the environmental policies in China. Without direction from a policy with environmental considerations, the staffs of ICBC are not aware of the relationship between the environmental issues and risks. The lack of awareness of environmental issues also led to

the loss of business opportunities generated from environmental issues and the loss of opportunities to be the first mover in marketing and customer cultivation.

Commercial banks can incorporate environmental considerations into their lending provisions, risk assessment and management. This can influence the customer to improve their environmental performance and can help identify, quantify and manage the potential environmental risks.

To enhance the risk management and to take the business opportunities, ICBC should develop a new policy with environmental considerations incorporated. All advanced experience of other commercial banks can be employed to help it develop its future policy. And this policy should be featured as follows with environmental considerations incorporated: 1) aiming to incorporate environmental issues into marketing and product and policy development; 2) embracing overall policies and specific policies for environmental risk management; 3) ensuring public participation and the utilization of external mental resources; 4) based on systematic information collection; 5) differentiating treatment of projects and customers with different environmental performance; 6) supported by training program; 7) serving as a effective communication tool and 8) sponsored by top management and effective governance.

Proactive banks' experiences and resources in environmental policies can help ICBC develop its future policy with environmental considerations from various aspects, ranging from adoption of environmental issues as strategy, risk management and products and service development to governance structure. ICBC should take advantage of these experiences and resources to serve its future policy and get competitive advantage in environmental issues.



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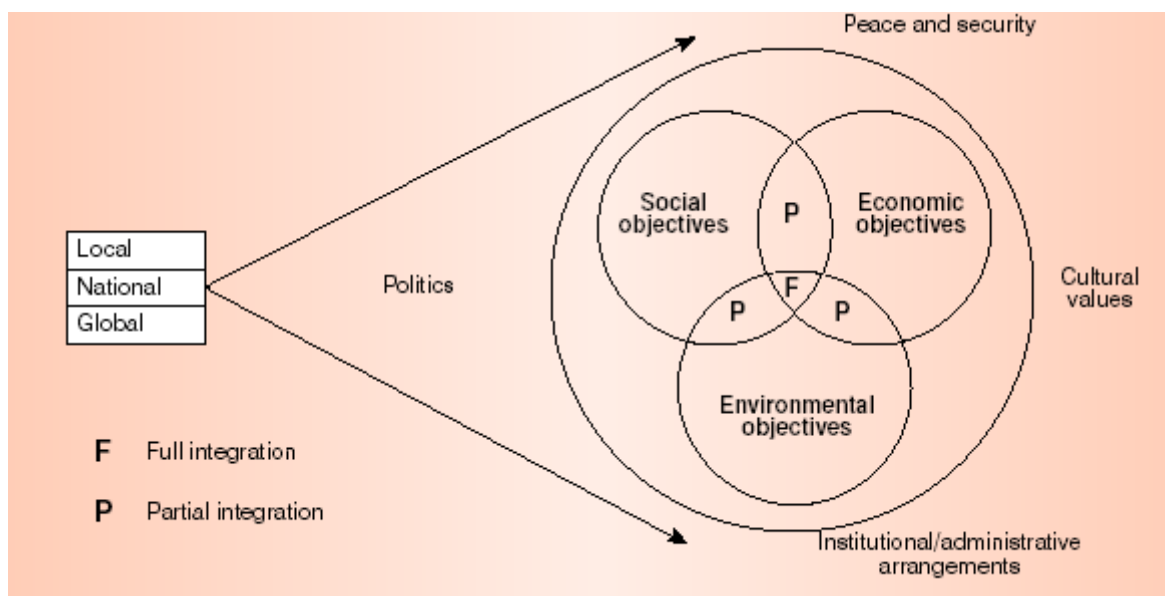
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# 1 Introduction

## 1.1 Background: Towards Sustainable Development

With the development of the economy in the last century, humans recognised that there are problems that constrain societal progress due to the negative social and environmental impacts of unplanned and unrestrained growth. Examples of the problems are: economic disparity and poverty, over-consumption of resources, environmental deterioration and many kinds of pollution (OECD, 2002, p.5). This recognition led leaders to plan and to hold the 1972 UN Conference on the Human Environment in Stockholm. This conference led to the creation of UNEP (United Nations Environmental Program) and IIED (International Institute for Environment and Development) and increased awareness and concerns, globally on environmental issues. The awareness of environmental issues resulted in the increased concern about “sustainable development.” The World Commission on Environment and Development (WCED), the Brundtland Commission, in its report, “Our Common Future,” defined sustainable development as “development which meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987, p.43).” This concept goes far beyond “environmental issues.” Environmental issues are only one of the three pillars of sustainable development: economic, social and environment (see Figure 1-1), which are complementary and interdependent in the development process. It emphasizes the integration of the three pillars - they should be integrated wherever possible and make trade-offs of them where necessary. The economic and social development should be based on high quality of environmental management. The impact of present decisions on future generations should be taken into account, the present development should not be at the cost of the interests of the future generations. This requires institutions or industries to balance the social, economic and environmental objectives when they develop policies or make decisions and ensure their implementation. (OECD, 2002, pp.11-12)



Source: (OECD, 2002, p.12)

Figure 1-1 System of Sustainable Development

Since the initial emergence of the concept of sustainable development, it has been continuously developed, enriched and broadened. The Earth Charter, for example, from the point of view of just, sustainable, and peaceful global society, broadened the concept of sustainable development to integration of environmental protection, human rights, equitable human development and peace. It serves as a framework of thinking and addressing these issues (Earth Charter Initiative, n.d., pp.1-2). This can be revealed from the independent principals of the Earth Charter, which are deemed to guide the conduct of all individuals, organizations, businesses, governments, and trans-national institutions (Earth Charter Initiative, n.d., pp. 2-3).

The first four principals defined the commitments of the Earth Charter: to respect and care for the community of life, which include “Respect Earth and life in all its diversity (principal 1)”, “Care for the community of life with understanding, compassion, and love (principal 2)”, “Build democratic societies that are just, participatory, sustainable, and peaceful (principal 3)” and “Secure Earth’s bounty and beauty for present and future generations”.

Principals 5 to 16 are the solutions to these commitments: ecological integrity, social and economic justice, democracy, non-violence and peace.

For ecological integrity, the Earth Charter calls for special concern for biological diversity and the natural processes that sustain life to protect and restore the integrity of Earth’s ecological systems, by adopting sustainable development plans and regulations at all levels, establishing and safeguarding viable nature and biosphere reserves, controlling and eradicating non-native or genetically modified organisms harmful to native species and the environment, and preventing introduction of such harmful organisms, and managing the use of renewable resources and the extraction and use of non-renewable resources (principal 5). The Earth Charter calls for preventing harm as the best method of environmental protection and use of the precautionary approach when knowledge is limited (principle 6), taking action to avoid the possibility of serious or irreversible environmental harm even when scientific knowledge is incomplete or inconclusive, making the polluters and responsible parties liable for environmental harm, ensuring that decision making addresses the cumulative, consequences of human activities, preventing pollution of any part of the environment and allowing no build-up of radioactive, toxic, or other hazardous substances.

Principal 7 of Earth Charter calls for the adoption of sustainable production, consumption and reproduction patterns. This includes reducing, reusing, and recycling the materials, relying increasingly on renewable energy sources, promoting the development, adoption, and equitable transfer of environmentally sound technologies, and internalizing the full environmental and social costs of goods and services in the selling price, and enabling consumers to identify products that meet the highest social and environmental standards.

And other principals respectively emphasize study, exchange and application of knowledge (Principal 8), eradicating poverty (principal 9), economic equity (principal 10), gender equality (principal 11), non-discrimination (principal 12), democracy, transparency and accountability (principal 13), integrating into formal education and life-long learning the knowledge, values, and skills needed for a sustainable way of life (principal 14), treating all living beings with respect and consideration (principal 15) and promoting a culture of tolerance, non-violence, and peace (principal 16).

To realize these, the Earth Charter calls for fundamental changes of the way we are living and universal responsibilities for the present and future well-being of the human family and the larger living world.

Towards sustainable development, attempts and initiatives are being made in different fields and at different levels, such as national and international law and conventions, economic instruments, schemes of EPR (Extended Producer's Responsibility), EMS (Environmental Management System) and IPP (Integrated Product Policy), and Cleaner Production (CP) or eco-efficiency, regional Agenda 21, etc.

It is very clear that for serious progress to be made toward sustainable development to occur, many changes in mentality, societal values, the way of thinking and behaving, such as production and consumption will have to be made. As an integral part of these changes, financial institutions will have to make changes in the way they operate national and international levels. Further, public-private partnership via corporations, governmental policy making, NGO's and other organizations will have to co-work to make sustainable development a reality. Part of the evolution of these approaches with corporations is beginning to occur with work corporate social responsibilities (CSR) of industrial and service sectors<sup>1</sup>.

Commercial banks, due to their unique position in business life and their strong relationship with industry, can play an important role towards sustainable development by influencing their customers with their products and policies. This has been recognised by the society and the banking sector itself, and some have developed comparatively advanced environmental policies, such as Barclays PLC and Bank of America, etc.

This thesis author explores how commercial banks in China can incorporate environmental issues into their business operation considerations, to achieve sustainable development of themselves and of their society.

## 1.2 Purpose and Research Questions of this Thesis

The purpose of this thesis is to analyse the project loan appraisal policy of Industrial and Commercial Bank of China (ICBC) to explore the possible benefits and business opportunities of taking environmental issues into consideration for its financing business operations and policies and how ICBC can implement them. This thesis's author wishes to raise the policy-makers' awareness of environmental issues by proposing a framework for its future policies and procedures. For this purpose, the following questions are addressed in this thesis:

- 1 What is the current project loan policy of ICBC? Does there appear to be any facets of it that may not support sustainable development for the bank and for the society? If so, what are they and what can/should be done?
- 2 How could environmental issues influence commercial bank's business operations?
- 3 What are the opportunities for ICBC to integrate environmental considerations into its business operations and policies?
- 4 What should its future policies be?

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<sup>1</sup> This part is based on the author's paper titled Integrating Cleaner production Concern into Policy-making of Commercial Banks: A Case Study of Environmental Policy of Barclays PLC, which was designed to link with this thesis. The use of this paper here has been approved by the tutor of the paper Lars Hansson and by the tutors of this thesis Lars Hansson and Don Huisingsh.

### 1.3 Methodology

This thesis starts from a broad view of sustainable development as background and then focuses upon commercial Chinese Banks. A literature review was done to understand the background and concepts of sustainable development, the role of commercial banks in business life **and their contribution to realise the vision of sustainable development**. Tools such as stakeholder involvement and CSR were employed to help focus upon why commercial banks should integrate environmental issues as new dimensions of their business operations, together with the consideration of asset security and profitability. A review was also done of how other banks such as the World Bank, Asian Development Bank (ADB); European Bank for Reconstruction and Development (EBRD), Barclays PLC, Bank of America may provide good examples for the Chinese banks for improving their environmental performance.

Additionally, activities of the relevant programs of UNEP, their environmental policy or program were reviewed to help this thesis author to formulate a framework for ICBC's future policy. During this process, relevant books, articles and information available via Internet were utilized.

To help understand ICBC, its business and project loan assessment policy, an indepth literature review and a case study on ICBC's project loan appraisal policy were performed, based upon the information obtained from ICBC's homepage. This included information such as its annual report, direction on business operations, etc., and other resources publicized through other channels such as internet online sources of legislation and policies ([www.law999.net](http://www.law999.net)) etc., and that were reviewed to learn how the current project loan appraisal policy functions and whether it has environmental concerns and environmental risk considerations, and whether it has provisions on environmentally-friendly-investment project loans, etc.

To help the readers understand the environmental issues and to back up the future discussion on how environmental issues influence banking business operations, some industrially related examples are used for illustrative purposes. In order to help the readers understand CP as a successful measure to solve environmental problems in China and its environmental and economic benefits, a case study on CP in China and a successful example are included.

Interviews in this thesis were obtained, mainly by means of telephone, to fill the gaps of some information which was not available through the literature review, such as questions on how environmental issues are treated in the industrial and banking sectors in China and how these issues have influenced the business of these sectors, etc. Detailed interviewee answers to questions posed by this thesis author are attached in appendix 1-7.

Even though the topic is limited to China, some banks in the world, as mentioned above, have their own comparatively advanced environmental policies and have extensive experiences and lessons. Since all commercial banks have some common features or characteristics, their experiences and lessons are employed in this thesis to support the discussion and analysis and can provide insight for the future policy of the commercial banks in China.

### 1.4 Scope

Environmental issues have a very wide scope, from any temporary or permanent changes to landscape, atmosphere, soil, water, plants, animals or humans caused by human activities, and in particular industrial activities; but for the purpose of some cases, it is also broadened to cover working environment for employees, such as occupational or public health and safety and sometimes hygiene issues, etc. (Knecht, 2003, p.3), which is the case in this thesis, even

though sometimes they are considered as social issues. But different industrial sectors have different environmental issues which are considered the main environmental impacts of that sector. So it's difficult to cover all of them. In this thesis, the author only focuses on issues related to industrial activities to illustrate how these environmental issues can influence the business operations of commercial banks and how they can be integrated into the business operations and policy development of commercial banks.

There are different financial institutions playing various roles in economic life, such as central banks, commercial banks, development banks, venture capitalists, asset managers and multilateral banks, etc. Due to the close and strong relationships with industry in business operations, this thesis author only focuses upon commercial banks.

The geographic scope of this thesis is limited to China. Because the economy of China is a transitional one: it is in the process of being transforming from a planned economy to a market economy, some enterprises have been transforming their ownership and operational mechanism and they are obtaining more and more freedom to make their own decisions. With the increase of income of households, domestic consumers are paying more and more attention to environmental and health issues and environmental legislation is becoming more and more stringent. For exporting enterprises, they have to meet the environmental standards set by the importing countries. These kinds of pressure, whether driven by the markets or legislation, or driven by their CSR as a member of the community and society, will force them to invest in environmentally friendly projects or programs, such as CP, or in development of environmentally friendly products. All these provide opportunities for the commercial banks to finance their customers in more environmentally sound ways. Under such a transitional economy background, and with the increasing demand for energy and resources due to rapid economic increases and population growth, if the commercial banks in China could integrate environmental issues into its business operations and policies at an early stage, it may help China to make more progress towards sustainable development.

As stated earlier, even though this thesis is mainly limited to China, inputs from other countries' commercial banks' environmental policies and their experiences and lessons are employed in this thesis to support the discussion and analysis.

This thesis author uses ICBC's policy as a study objective because of its applicability to commercial banks in China. This is not only because ICBC has the largest market share in some businesses, such as deposit and lending, but also because of the monoculture among commercial banks in China, as they were mainly set up by the government and have the similar business scope and products or services and even similar governance structures. Even though they have been on the way of reform towards commercial banks like that in other parts of the world, they have a long way ahead and it will take time, especially to change their monoculture.

For ICBC's business, the author focuses upon its project loan operation and policy. For commercial banks have very small environmental impacts in their own business operations; comparatively, their provision of financing projects, which may have negative or positive environmental impacts, has strong and far-reaching influence on industrial activities from the perspective of environmental issues. This author calls this the indirect environmental influence of commercial banks.



## 1.5 Limitation

Because the specific policies are considered commercially confidential, the description and analysis of ICBC's business operation and policy was performed based on the information available via internet and telephone interview. The relevant information available was derived from:

1 ICBC fixed assets project loan assessment policy, available at: <http://www.law999.net/law/doc/c003/1997/07/15/00085137.html>

2 Lending provision or conditions relevant to project loans, available at ICBC's web page: [http://www.icbc.com.cn/e\\_icbcmodule/thirdindex.jsp?column=Corporate%2BBanking%3EFinancial%2BBusiness%3EFixed%2BAssets%2BLoan](http://www.icbc.com.cn/e_icbcmodule/thirdindex.jsp?column=Corporate%2BBanking%3EFinancial%2BBusiness%3EFixed%2BAssets%2BLoan)

3 Other information relevant to the project loan appraisal policy which is publicized through other channels, such as its fixed assets loan provision, annual report, etc.

On the other hand, some data on ICBC's business are also considered commercially confidential, so when the author presents some data in the thesis, he had to deal with this kind of data in some technical way. For example, he does not mention the data itself, but illustrates the facts in percentage, etc.

For a topic about China, data availability is sometimes a problem. With the help of friends, the author made contact with ICBC's project loan appraisal staff and they frankly answered the author's questions. But when the author tried to collect information from the authorities and some enterprises, they were reluctant to provide more information than that which has already been released via internet or other media, due to internal regulation on information release, and due to the fact that the interviewees were not willing to cooperate and take the "political" risks generated from words. This fact was also underscored by some foreign scholars (U.S. Embassy Beijing, 2000).

For policy itself, it is practical and detailed, and should be reviewed and updated to adapt to the changed conditions, such as regulations and market, etc. In this paper, the framework provided in this thesis is generic, and is designed to show the direction for the future policy, based on insight obtained from successful experiences of other commercial banks.

## 1.6 Structure of the Thesis

Section two presents background information, including corporate social responsibility and the role of financial institutions in business life to show why organisations should take environmental issues into consideration for policy making and for business operations.

Section three is an introduction to China's banking system, ICBC and its business, aiming to help the readers understand the position and background information of ICBC.

Section four addresses ICBC's project loan appraisal policy. Fixed assets investment and the project loan in China are generally described; the focus is on the introduction of the policy itself.

Section five is an introduction to some environmental issues related to industrial activities. The purpose is to help the readers understand these issues and to support the discussion in section six on how environmental issues influence commercial bank's business operations and how they can be incorporated into their business operation considerations. Environmental

issues in China is also introduced in this section to help the reader understand the environmental situations in China and the measure taken to solve the problems and the trend of its future change, to back up the discussion how this change will influence ICBC's business.

Section six is an analysis and discussion. The potential threats to ICBC and other commercial banks' business operations, due to possible problems in their current policy, are first analyzed, from the perspective of risk management and business opportunity; then opportunities for ICBC to integrate environmental and related risk issues into their business operations and policies are addressed. Finally, a proposal is made for a possible framework for ICBC's future policy.

In the last section, conclusions are presented to answer the research questions.



## 2 Background Information

Organisations, especially economic organizations, have to compete with their competitors to survive, although sometimes they collaborate with each other for their shared interests. The world today is changing fast and the consumers, whose need is the driving force for the producers or service providers to be alert to change to adapt themselves to the changing environment, are dominating the market. In this section, the author presents how the concept of sustainable development has been the driving force for corporate and banks to take their social responsibilities seriously and how they take this opportunity to “green” their business.

Commercial banks play special roles in business life and have close relationships with industry. It has been recognised both by the financial industry and the public that commercial banks can contribute to sustainable development if they can “green” their business. As background information, commercial banks’ role in business life and how they interact with industries are also illustrated in this section.

### 2.1 Corporate Social Responsibility (CSR)

Organizations today are expected not only to provide goods and services, but also to take their social responsibility to contribute to the community or society as a corporate citizen. In this section, the author demonstrates how they are making business changes to adapt to this trend and integrate it into their business operations.

#### 2.1.1 Organizations in Changing Environment and CSR



Source: Hess & Siciliano, 1996, p.11

*Figure 2-1 Stakeholders of an Organization*

The society today is largely made up of various organizations with different goals. Organizations are defined as “a group of people working together to achieve a common purpose (Hess & Siciliano, 1996, p.6).” By working together, humans can achieve some goals that individuals cannot. But in our society organizations are interconnected like a web (Hess & Siciliano, 1996, p.10). They are dependent on and affect each other. For example, a business company should depend on the community where it operates its business. The community provides the resources of water and energy supply, skilled employees, consumers for the company; the government both national and local provides a good environment for equal competition by setting market rules and regulations. On the other hand, the company provides the community with goods and services to meet their needs, it contributes to the community with taxes and revenues, employment and itself is also a consumer of the products and services of other companies.

The concept of stakeholders is a good way to illustrate this interconnectedness. Figure 2-1 (see last page) diagrammatically presents various organizations, groups, individuals which have interest or stakes in the performance and success of an organization. They are connected due to their functions and various needs expectations from different parties. If one falters or fails, all organizations and individuals around will be affected. (Hess & Siciliano, 1996, pp.10-12)

All organizations have their own goals which vary according to the purpose of the organizations themselves. But they have one common feature that they exist to meet the needs of different stakeholders, such as customers, employees, government, financial institutions, etc. But the world today is changing fast (Hess & Siciliano, 1996, p.12), such as more stakeholders are interested and involved in the organizations’ activities, and fast changing policies, technologies and social conditions. The examples of these significant changes are economic globalization as opposed to further efforts to ensure local control. There are many mergers and acquisitions, combined with the emergence of new competitors, the widespread use of information technologies, increases in consumers concerns and interest. To contribute to the society and to help to solve the problems generated from the production and consumption activities. (Hess, & Siciliano, 1996, pp.12-21). Within this context, the organizations should go beyond just meeting the needs of individuals to meet the needs and expectations of society, such as creating more jobs and revenues and participating in the community affairs. In this section, the author focuses upon organizations’ corporate social responsibility.

“Social responsibility is the obligation of organizations not only to provide society with goods and services, but to contribute to the social well-being of the communities where they operate (Hess & Siciliano, 1996, p.52).” It is in some cases called “corporate citizenship” or corporate social responsibility (CSR), which is defined by WBCSD (2000, p.8) in 1998 as “the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large.” It is comprised of five important priorities: human rights, employee rights, environmental protection, community involvement and supplier relations (WBCSD, 2000, p.10). Commission of the European Communities (EC) defined CSR in the Green Paper of 2001 as “a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis (EC, 2002, p.3).” There is no universal definition of CSR or social responsibility since different actors have different understanding, but from the above definitions we can find that it covers the social and environmental concerns in the company’s business operations and the interaction with different stakeholders (EC, 2002, p.5). This means that “socially responsible” organizations do not only pursue profit, they take social

responsibility in the above-mentioned five areas as part of their business and are equal to profit in importance.

This concept originated from the public pressure, as the production and consumption activities caused increasing problems, such as pollution and environmental decay (Hess & Siciliano, 1996, pp. 52-53); in some cases, it is mandated by the government to ensure that the employees, consumers and the public responsibility are appropriately treated (Hess & Siciliano, 1996, p.15). Van Berkel, in his doctoral dissertation *CP in Practice* (as cited by Baksh, 2000, pp. 24-25), presented some internal and external drivers for responsible corporate citizenship. The internal driving forces are: leadership and management commitment, employee involvement, occupational health and safety programs, cost awareness and internal research and development; the external ones are: environmental legislation, market pressure, public pressure and the new technological opportunities. All these forces are driving firms to alter their behaviour and to take their corporate citizen responsibility seriously to promote sustainable development.

For a company to take their social responsibility seriously there are four levels of contribution forms: traditional philanthropy, low partnership, high partnership and ecobusiness (Hess & Siciliano, 1996, pp.56-58):

At traditional philanthropy level, the charitable donation of a company's resources is the main form of social responsibility; at low partnership level, the companies take active part in the community affairs; at the high partnership level, the main features are that companies change their structures and the way they function to the interests of the employees and the employee's participation, teamwork and value diversity; at the ecobusiness level, which is the highest level at which companies may engage, not only are employees fully participating partners, but the companies also incorporate the consumer's interests and public concerns into their businesses. This may include approaches to "green" business such as reducing the environmental impact of their products and production by using recycled materials and developing and introducing pollution free technologies such as *CP technologies*, etc. in response to the public concern on environmental issues, healthy issues and the attempts and initiatives towards sustainable development.

### **2.1.2 CSR as a New Dimension of Business Strategy**

The emergence of the concept of sustainable development in 1970s has been influencing the world significantly. Businesses have been involved in this trend whether voluntarily or obligatorily. Recognition of unsustainable production and consumption as the source of the environmental problems we are facing today has led to some attempts and initiatives for the companies and consumers to take their responsibilities to change towards sustainable ones.

The Earth Charter (ECI, n.d.), as stated earlier, affirms 16 interdependent principles for a sustainable way of life to guide all individuals, organizations, business, governments and transitional institution towards the goal of sustainable development. They are called up to take universal responsibility and shared responsibilities to solve the problems, such as applying preventing or precautionary approach, adopting environmentally sound technologies and production systems to reduce the environmental impacts; multi-national corporations and international financial organizations are required accountable for the consequences of their activities. The Global Compact (UNGC, 2004), which addresses the environment, human rights and workers' right (Leipziger, 2003, p.73), seeks to have business take their corporate citizenship responsibility to help realize the vision of sustainable and inclusive global economy and asks the companies to embrace, support and enact within their sphere influencing a set of

core values in the areas of human rights, labour and the environment. Its principles 7-9 embrace the precautionary principle, business's environmental responsibility and the development and diffusion of environmental friendly technologies, which are derived from the corporate environmental responsibilities and principles defined by Agenda 21 (UNGC, 2004a). The participants are asked to communicate on their progress made in implementing the nine principals by means of annual report or sustainable report and it is the "first initiative on corporate responsibility aimed at companies to emerge from the UN Secretary-General's office (Leipziger, 2003, p.73)."

This trend forces the businesses to take their corporate social responsibility seriously to contribute to the community to meet the expectation of the public. Since 1990s, the increasing environmental concerns from different stakeholders and the belief that "green" business will pay through cost reduction and market entry have been driving companies to change their strategy; environmental management has been taken as a strategic tool to gain competitive advantage (Welford & Starkey, 1996, p.31). Some corporate front-runners, as Preben Sorensen pointed out, proactively recognised the potential value of meeting and shaping these expectations (Bouma, Jeucken, Klinkers, 2001, p.17) and successfully integrated this into their business operations and use it as a strategic tool. They take business as part of the cause of some social economic and environmental problems (Hess & Siciliano, 1996, p.54) and consider that their social responsibility is "the primary reason for their existence" and "the organization's mission"; profit is a way to help fulfil that mission (Hess & Siciliano, 1996, p.58). McDonald's and WalMart are quoted as good examples of companies that are taking their social responsibility seriously to reduce the environmental impacts of their business operations. McDonald's has invested over 500 million U.S. dollars since 1990 on recycled products ranging from paper napkins to building insulation and roofing materials; WalMart had its stores designed "green", such as using skylights to reduce the use of electricity for lighting, no use of air conditioners with Freon as coolant and use of recycled building materials (Hess & Siciliano, 1996, p.15).

### **2.1.3 CP as a Strategic Approach to Ecobusiness**

As discussed earlier, ecobusiness is the highest-level for a company to take its corporate social responsibility seriously and to contribute to the community where it operates. There are various ways to achieve ecobusiness. This section focuses on CP as a strategic approach to help the industry realize ecobusiness and to sharpen its competitiveness.

UNEP (2004) defined CP as:

*the continuous application of an integrated preventive environmental strategy to processes, products, and services to increase overall efficiency, and reduce risks to humans and the environment. CP can be applied to the processes used in any industry, to products themselves and to various services provided in society.*

This definition shows that CP is a new thinking of how the goods and services are produced and delivered. It covers the production process, products and services, the aim is, to increase the overall efficiency and minimize the environmental impact, over the whole life cycles, such as conserving raw materials, water and energy, eliminating toxic and dangerous raw materials; reducing the quantity and toxicity of all emissions and wastes at source during the production process; reduce the environmental, health and safety impacts of products all through their life cycle; and incorporating the environmental concern into designing and delivering services. All these will not only meet the customer's need of goods and services in a sustainable way, which is part of the essence of sustainable development, but also meet their expectations of environmental protection and health concerns.

CP is “not simply a technical solution,” it’s also “a continuous process of improvement (UNEP, 2003, p.7).” By aid of CP technology and management, the companies can reduce the use of resource, reduce the generation of wastes or emissions during processes and reduce the environmental impacts of their products all through their life cycles, as stated earlier. These approaches result in cost savings, either production costs or waste management costs, and hence help increase the profits of the company and accelerate the payback time of investments. Even though the initial investment of cleaner technology might be higher than the conventional ones, the benefits generated in their whole life can far out-weigh installation and operational costs of End-of-Pipe, pollution control equipment..

Besides, CP can also increase the competitiveness of companies (UNEP, 2003, p.7). High environmental-performance products have better image and are easily accepted by the consumers in the markets where there are environmental concerns; when the government policy becomes more stringent, the companies with CP introduced are more ready for the change and hence have first mover advantages; for some exporting companies, if the importing country has environmental standards for the products sold in the market within that country, the output of CP- products with high environmental performance, is undoubtedly a licence for entering that market. To some extent, we can say that the society’s environmental concern or sustainability concerns can result in potential for new markets, it depends on whether you are sensitive enough to notice the change of the public concern and the business opportunity behind and whether you are ready for that. But CP ensures the readiness for entering these new markets with high environmental performance, especially for those with beyond compliance performance goals and objectives.

From the risk management of view, CP can reduce the environmental risk and avoid cost associated with industrial accident, consumer boycott or environmental lawsuit (Reinhardt, 1999, p. 157). At one time or another, the companies, especially those of the so-called polluting enterprises, such as chemical, painting, textile, oil refineries, etc., have to face the costs of clean-up, conversion costs, environmental damage liabilities or additional environmental investments (Jeucken, 2001, p.120), whether forced by the government or the market, but by aid of CP, all these can be avoided or at least minimised, from their root sources.

It can be concluded that CP is a preventative approach to environmental management and considered as a 'win-win' strategy (UNEP, 2004). Not only the company can benefit from the increased industrial efficiency, profitability, and competitiveness due to the introduction of CP, the expectation is for it to take its responsibility to protect the environment and improve the health conditions of its production and products can also be met; and by aid of investment in CP, the investors can show the stakeholders that they are socially responsible and their “dividends are not obtained at the expense of the environment, indigenous groups or at a hidden cost to the future generations(Davis, 2001, p.23).”

## 2.2 The Role of Financial Institutions in Business Life

Financial institutions, such as central banks, commercial banks, development banks, venture capitalists, asset managers and multilateral banks, play important and active roles in business life. For the purpose of this thesis, emphasis is placed on commercial banks. In this section, the role of commercial banks in business life and the interlinkages between commercial banks and industry is presented.



### 2.2.1 The Role of Commercial Banks in Business Life

Banks, are defined as different institutions that may and do engage in various financial or even some non-financial activities whether on their own account or in an agency or advisory capacity. Their traditional businesses are deposit and lending, but modern banks today have expanded their business scope far beyond those functions. They play three key roles: “as the repository of liquidity, as the core payment mechanism, and as the principal source of finance to at least a large part of the economy” (George, 1997, pp. 251-252). For the purpose of this thesis, only the last role, principal resource of finance, is illustrated, in detail, because this is one of the key business activities of commercial banks.

Commercial banks are “institutions which use the funds entrusted to them by their customers to extend loans to consumers and business customers and distribute profits to the banks shareholders (Jeuchen, 2001, p.53)<sup>2</sup>”. In the business life, commercial banks play the role of an intermediary. This includes the role of payment clearing and bridging the lender and borrower (Jeuchen, 2001, pp.55-56).

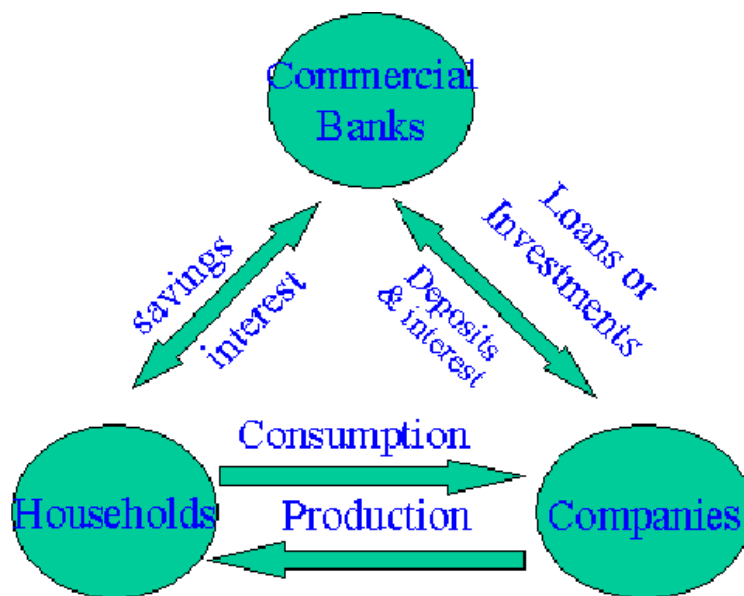


Figure 2-2 The role of commercial banks in business

Source: Adapted from Jeuchen Marcel, *Sustainable Financing and Banking: The Financing Sector and the Future of the Planet*

Figure 2-1 is a simplistic model demonstrating the role of commercial banks in business life as a commercial lender. Of course, in reality, the situation is far more complicated, for example there are more actors playing in the economic life, such as governments, international markets, etc.; and it has to be stressed that banks today are always multifunctional, besides savings and financing (lending), their businesses also cover investment, security, payment, guarantee, trust,

<sup>2</sup> Of course the business of commercial banks today, goes far beyond saving and loan, especially for universal banks, their businesses may cover those of various financial institutions, such as security market business, investment banking business or assets management business, etc.

mediation and advice, etc., for the purpose of this paper, the author tries to make it simple and only briefly describes their function of lending.

The households with money surpluses save their money in the commercial banks, the commercial banks can use this money to finance, on their own behalf and risk, the companies who are short of funds. So commercial banks are playing an important role: the supplier of funds in the supply chains of corporations.

One person's surplus of money during a certain period can not meet the demand of companies that are short of funds, in the appropriate scale, time and place. Besides, the individuals don't have the skills and knowledge to assess the risks of investment. The intermediary role of commercial banks can help bring together the surpluses and deficits of money by matching the borrowers and lender. They can transform the money by scale, term and place to meet their demands or balance the supply and demand of different scales at different time, even in different places. And commercial banks have advantage over individual households in assessing the risks; the advantage of large scale of business can have commercial banks spread the risks and reduce the transaction costs. Thus, the individuals can have the risks transformed by aid of the information services and intermediary role of commercial bank (Jeuchen, 2001, pp.55-56).

The goal of commercial banks is to maximize the returns and to minimize the risks they accept (UNEP, n.d. p.3). To achieve these goals, commercial banks must screen borrowers and monitor the loans (Jeuchen, 2001, p.56), with the aid of loan management policies and tools, such as internal customer assessment system, credit line, loan appraisal policy, systematic information collection and analysis (e.g. ratio analysis), etc.

The borrowing and lending process is also a money creation and allocation process. The money creating process can influence the total money supply of the society; and the allocating process distributes money in different sectors. Both of these processes can influence the economic growth and its nature (Jeuchen, 2001, p.55). From this point of view, the commercial banks can play an important role towards sustainable development. For example, through their lending policy and business operation, they can create more opportunities to finance the "green" business of their customers; by taking advantage of their knowledge and information about different market sectors, regulations and market development, can influence their customers and stimulate sustainable development, etc. (Jeuchen, 2001, p.52). [On the reverse, if they finance un-environmentally sound projects or business, it will undermine the vision and goal of sustainable development.](#)

### **2.2.2 Interlinkages between Commercial Banks and Industry**

Section 2.2.2 emphasises that commercial banks have close relationships with industries, especially small and medium size enterprises, which, due to their shortage in fund supplies, are dependent to commercial banks to various extents.

Commercial banks and industries interact in different ways:

Firstly, commercial bank's loans are one of the main sources of funds for companies. To survive and prosper, from an economic point of view, companies must generate incomes, such as profits and cash flows. And to generate income, they have to raise capital from investors and lenders to meet the demand of fund input for the daily production and management (UNEP, n.d.-a, p.5). To survive in the long-term, companies need to invest in new equipment, such as to expand the production capacity, or to replace the outdated, worn-

out, or damaged equipment. They also need to invest in maintaining the existing equipment and operations or modifying existing equipment, processes, and management and information systems to improve efficiency, reduce costs, increase capacity, and improve product quality. To meet the changed environmental legislations or standards and to improve the working environment to improve the worker safety situations, additional investments are also necessary (UNEP, n.d.-a, p.17 & UNEP, n.d.-b, pp. 6-7). This kind of long-term investment is generally called project investment, which always means large amount of fund demand.

To solve the problem of large demands for money, companies can raise money from different sources. Internally, they can use part of their profit and cash flows generated by the business and retained within it, or raise capital from investors (shareholders); externally, they can get grants, subsidies or funds from the government, or borrow from financial institutions or obtain finance from trade finance such as from suppliers or customers (UNEP, n.d.-c, pp.3-6). How much a company depends on commercial bank's loans varies extensively. It depends on the scale of the company, the financial institution itself, the industrial sector it is in and the national industrial policy where it is situated.

Secondly, commercial banks and industries are dependent on each other. Companies are the customers of commercial banks. They use banking services to clear their payment of their business transactions or payment for other activities and pay commissions to the banks; they also use the products of commercial banks such as loans to meet their certain demand such as investment as we mentioned earlier, for which they pay interests to the banks. Interests and commissions are the main source of income of commercial banks. Thus the companies have to choose their own accounting bank to use their services or products, at reasonably lower costs and of a certain quality; commercial banks, to minimize the risks they accept, have to screen their customers or borrowers to market their products and services to ensure a reasonably higher returns from them.

Thirdly, they influence each other. The most apparent fact is that the risks companies encounter, whether generated from changes of market or policy or legislation, can be converted into risks to the banks, if these risks affect the repayment capacity of the companies. To be financed, the companies have to meet the provisions of the commercial banks' loan policies, thus, the policy provisions of commercial banks can influence the activities of their customers. The commercial banks can also influence the customers by means of their advisory services, especially when the banks are conscious about their responsibilities for helping to promote sustainable development, they can raise the awareness of their customers and suggest to them that they invest in green business approaches such as CP to gain more advantages over their competitors and hence to change the directions of corporate investment.

### 2.3 CSR and Commercial Banks

Since the commercial banks play such an important role in the business life, their stance will be critical in contributing toward helping to make progress towards building a sustainable society (Jeucken, 2001, p.52). Just as the Chairman of Westpac Banking Corporation Leon A. Davis (2001, pp.29-30) mentioned, bankers are conscious of their social responsibility and if they do not expand their view of what constitutes socially responsible behaviour, "they will soon lag behind global best practice for their industry". So commercial banks should take their corporate social responsibility seriously and take social and environmental issues into consideration to "green" their business, aiming at "maximising the long-term contribution of business to society and taking care to minimize adverse impacts (WBCSD, 2000, p.3)." The greening finance will serve as a powerful indirect mechanism to help incorporate the

environmental costs (Stielstra, 1999) and can help encourage sustainable development (Siegel, 1999).

In October 2002, the International Finance Corporation (IFC) convened a meeting to discuss the environmental and social issues in project finance. The present banks decided to develop a banking industry framework to address environmental and social risks in project financing. This led to the Equator Principles (2003). The adopting banks declared that “We recognise that our role as financiers affords us significant opportunities to promote responsible environmental stewardship and socially responsible development” and commit themselves to provide no loan directly to non-environmentally sound projects.

Maths Lundgren (1996, pp.125-128), based on his study, mentioned that some banks such as the Union Bank of Switzerland (UBS), the National Westminster Bank of the UK and some Scandinavian financial institutions have displayed interest in environmental concerns. The *UNEP Statement by Financial Institutions on the Environment and Sustainable Development* (UNEP, 1997) called for collective responsibilities for ecological protection and sustainable development, which should be highly prioritized among all business activities, including banking, which is committed as an important contributor to sustainable development. It asks the signatories to encourage and influence their customers to use the “best practice” in environmental management and integrate environmental awareness into their own business activities.

In the last two decades, there has been increasing awareness of the social and environmental issues, due to the growing public interest in these issues and regulatory frameworks, with the international standards and directives included (Dunn, 1999). In the Fifth International Roundtable Meeting on Finance and the Environment - New Roles for Finance in the Race to Sustainability (UNEP, 1999), some banks like Deutsche Bank, EBRD, Bank of America and South Shore Bank presented different initiatives and schemes showing that they have integrated environmental issues into their business operations to green their business. For example, South Shore Bank presented that it has made a commitment to green its entire operations comprehensively, starting from combining community development with ecosystem restoration, supporting business entrepreneurs’ building “green” markets, to employee training, adapting ecological management system and “internal greening”, and finally they aim to develop new financial products and services to be part of the new sustainability commerce (Crane, 1999).

EBRD (1996, pp.28-31) is a front-runner in incorporating environmental considerations into business operations to ensure environmental soundness of the projects it finances. In its founding agreement, environmentally sound activities and sustainable development have been given as proactive mandate by its founders. This is a highlighted feature of it. And it has been the consciousness of EBRD that sustainable development is a fundamental aspect of sound business management and that the pursuit of economic growth and healthy environment are inextricably linked. Sustainable development has been ranked in the highest priorities of its activities. In its environmental policy, environmental soundness of the projects and the monitoring of their environmental performance through its environmental appraisal process have been set as the objectives of the policy. To promote its environmental mandate, environmental issues have been incorporated into nine areas: 1) sector and country strategies; 2) environmental appraisal; 3) environmental standards; 4) environmentally oriented operations; 5) technical cooperation; 6) regional and global initiatives, 7) developing the local environmental goods and services sectors; 8) public consultation and 9) provision of information. To ensure implementation of the nine strategies, EBRD has established units to oversee the environmental appraisal process and to initiate and develop environmentally

oriented operations. Different actors are endowed with different responsibilities for environmental appraisal (EBRD, 1996, pp. 2-3). This is discussed in section six where its and other banks' experiences will help ICBC develop its future policy.

For commercial banks, their direct environmental impact, which originates from their daily activities, is comparatively lower; but their indirect environmental impact, which comes from the projects they have financed, is apparent (Lundgren, 1996, pp.125-128). So it will make more sense if commercial banks "green" their loan businesses by integrating the environmental concerns into their loan business operations and policies, such as by financing environmentally-friendly projects like CP projects or technologies, developing products to meet their customers' needs for sustainable businesses, etc. By doing this and reporting to the stakeholders, the commercial banks not only exhibit to their stakeholders that they are socially responsible corporate citizens by their efforts to stimulate certain developments in society towards sustainability (Bouma, et al, p.35), but also benefit from the environmental concerns from the perspectives of risk management and business opportunities. This is discussed in greater depth in section six.

## 3 The Banking System in China and ICBC

### 3.1 Banking System in China

China's banking system has been evolving and formed its initial framework. We will, to help the reader have a better understanding, in this section have a brief introduction of its history and main actors.

#### 3.1.1 Brief Introduction

Before 1978, when China started its opening policy, China had a mono-bank system. The People's Bank of China (PBC), under the planned economy mechanism, took both the responsibilities of central bank and commercial banks, making and implementing the cash and credit plan according to the production plan made by the State Planning Commission of that time (Wong Y.C.R & Wong M.L.S., 2001, p.19). Bank of China (BOC) had been the only designated bank dealing with foreign exchange business (BOC, n.d.). The period between 1979 and 1984 is the time China began to reform its banking system. During this period, the Agriculture Bank of China (ABC), ICBC, the People's Construction Bank of China (PCBC)(its name was changed to China Construction Bank in 1996, CCB) were split from PBC. PBC took the responsibility of the central bank with the responsibility for monetary policy and banking system supervision; ABC, ICBC, PCBC and BOC, which were called specialized banks, had their own designated customers and business: a. ABC received the deposits in rural areas and financed the agricultural production projects and township business; b. ICBC financed the industrial and commercial business in urban areas; c. PCBC was responsible to appropriate funds for capital construction from the state budget, and d. BOC still focused on deposit and loan of foreign exchange and international business.

Since 1985, the Chinese authorities aimed to reform the banking industry. The restriction of their business and customers to the designated sectors was removed and they were encouraged to compete with each other. After 1994, when the three policy banks – China Development Bank, the Import and Export Bank of China and the Agricultural Development Bank of China, were established, the business of development banks was taken away from the so-called specialized banks. The specialized banks were expected to be converted to real commercial banks. (Wong Y.C.R & Wong M.L.S., 2001, p.20)

Since the establishment of the Bank of Communications (BOCS) in 1987, there have been twelve joint-equity commercial banks established. The other eleven of them are: the CITIC Industrial Bank, China Everbright Bank, Hua Xia Bank, China Investment Bank (merged into the China Development Bank in December 1998), Chin Minsheng Banking Corporation, Guangdong Development Bank, Shenzhen Development Bank, China Merchants Bank, Fujian Industrial Bank, Shanghai Pudong Development Bank and Hainan Development bank (closed up in June 1998). Besides, the banking system, there were a large number of small financial institutions, 3240 urban credit cooperatives and 41,500 rural credit cooperatives by the end of 1999; some large cities have restructured their urban credit cooperatives into city commercial banks, and 88 city commercial banks have been established by the end of 1998 (Li, Liu, F., Liu, S. & Whitmore, 2001, pp. 152-153). Foreign banks also have an important role in China's banking industry; the number was, by the end of July 2003, 151 branches, 16 legal entity organizations and 211 representatives (CBRC, 2003), and this is changing rapidly.

In May 2003, to enhance the function of PBC in setting monetary policy and to strengthen the supervision of China's banking industry, a new banking regulatory body - China Banking Regulatory Commission (CBRC) was set up to assume the supervisory responsibility from PBC; instead, PBC will focus on the responsibility to set and implement monetary policy.

So, in summary, the banking system in China today is comprised of:

One central bank: People's Bank of China;

One supervisory body: China Banking Regulatory Commission;

Three policy banks: China Development Bank, the Import and Export Bank of China and the Agricultural Development Bank of China;

Four state-owned commercial banks: ABC, ICBC, CCB and BOC;

Ten joint equity commercial banks;

Some city commercial banks;

A large number of urban or rural credit cooperatives;

and some foreign banks.

Even though the joint equity commercial banks and foreign banks are late-comers in China's banking system, they are developing rapidly and are playing important roles. Their market shares are increasing every year. For the purpose of this thesis the author addresses his attention more extensively to the state-owned commercial banks, which are the main concern of the reform of China's banking industry and the dominating role in the banking system.

### **3.1.2 State-owned Bank**

As stated earlier, the state-owned banks are the result of the reform of the banking industry of China. They were once used as the policy tools to achieve the national economic development goals; but today, they are taking concrete approaches towards real commercial banks.

To minimize the governmental interference of local banking industry, PBC, the central bank, restructured its provincial branches nationwide. Nine new regional branches replaced the original provincial level branches in each province, municipality and autonomous region, taking the responsibility of banking industry supervision, and part of this responsibility is being handed over to the newly established CBSC. The senior officials of the bank are no longer appointed by members of the local government. Besides the laws and legislation made by the national congress, such as the 1995 Commercial Banking Law of the People's Republic of China, the PBC and CBRC have made and are making some regulations requiring the state-owned banks to empower the banks to have their own autonomy to operate their businesses according to effective market discipline and to meet the internationally recognised standards for commercial banks, such as ensuring sufficient capital adequacy and the five-category loan classification standard <sup>3</sup>(Wong Y.C.R & Wong M.L.S., 2001, p.36) , etc.

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<sup>3</sup> Five-category loan classification standard is an internationally accepted loan rating system, according to which, all loans are classified into five categories: normal (pass), special mention, sub-standard, doubtful and loss (unrecoverable) based on the

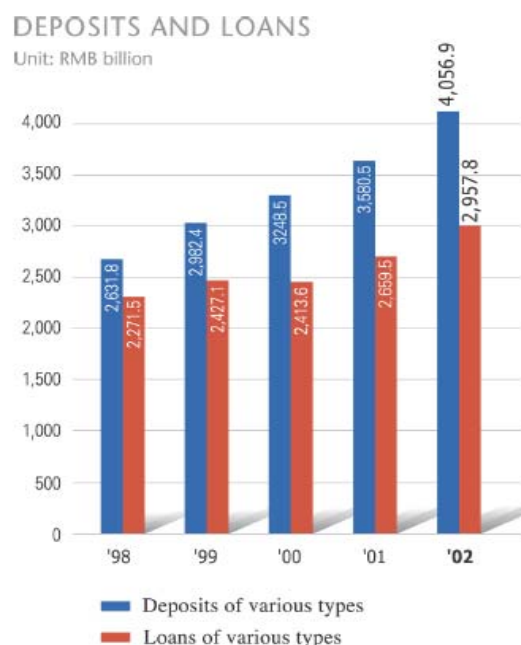
For the state-owned banks, profitability and risk management have been the main concern of their business operation. Running business within the restraints of law and regulations has been the shared view among them, both the top management and staff. The five-category loan classification standard has been introduced; large numbers of non-performing loans, resulted from the historical policy lending, have been divested from the four state-owned banks, and a stock market has been introduced, for trial, to solve the problem of capital adequacy.

Another outstanding fact is that the four state-owned banks still have the dominating role in China's banking industry, although the ratio of concentration of assets, deposits and loans are decreasing (Wong Y.C.R & Wong M.L.S., 2001, p.23). The latest data reveals that from an assets point of view, the four state-owned commercial banks, at end of March 2004, they had 55.1 percent of the total assets and 61 percent of the total profits (pre-tax) of all financial institutions in China (CBSC, n.d.)<sup>4</sup>.

### 3.2 ICBC and its Business

ICBC, as stated in the previous section, was established in 1984 to take the commercial business functions from PBC. After 20 years development, it has been become the largest commercial bank in China. Its development has been recognised by some famous international financial cycles, such as the Banker, the Global Finance, Fortune and the Far Eastern Economic Review. In 2003, the "Banker" ranked it the 16th among the top 1000 World Banks; it was rated among the "Global Top 500" by "Fortune," for five consecutive years according to the first class capital, and listed among the Top 10 Quality Products (Services) by the "Far Eastern Economic Review" (ICBC, n.d.-e).

Its business covers a large variety of facets, including deposits, loans, settlements, agency, guarantees and testimonies, discounts, credit investigations and consulting services, spot and forward exchange trading agency, issuing or as agency for issuing securities, working as intermediary of international financial institutions and foreign governments on loan arrangements, and other businesses authorised by CBRC. Its 2002 Annual Report (ICBC, 2003) reports that some of its businesses are increasing very rapidly, such as deposit and loans (see Figure 3-1), especially some new businesses<sup>5</sup> like customer loans (see Figure 3-2, next page), E-Banking Transaction (see figure 3-3, next page) and international



repayment ability of the borrowers. The last three categories are recognized as Non – Performing Loans. The Chinese banking industry had been using a four-category classification system till 2004, in accordance with the Financial System of Finance and Insurance Company, promulgated by the Ministry of Finance in 1988, in which the loans are classified into normal, past-due, idle and bad. The last three categories being recognized as Non – Performing Loans.

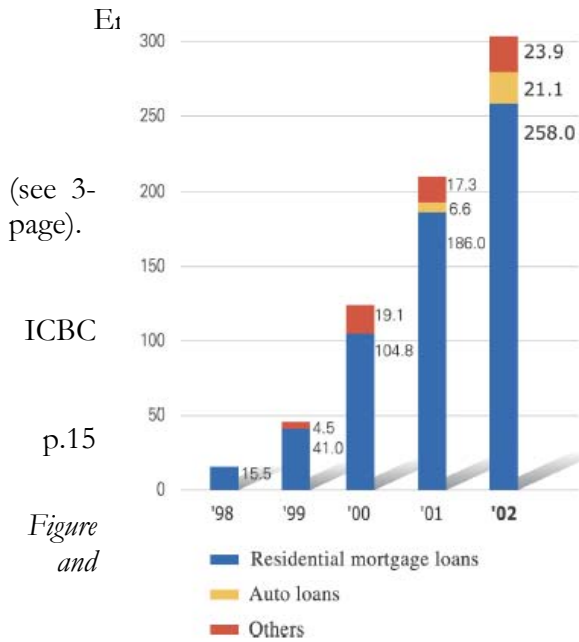
<sup>4</sup> Data of loan and deposit of the same tome is not available yet, even in the webpage of the banks.

<sup>5</sup> Of course some business in Western countries today are conventional businesses, such as customer loan, credit cards, etc., but in China, these kind of business are rather new and were developed only years before, that is why the Chinese banking industry call them "new business".



### CONSUMER LOANS

Unit: RMB billion



(see 3-  
page).

ICBC

p.15

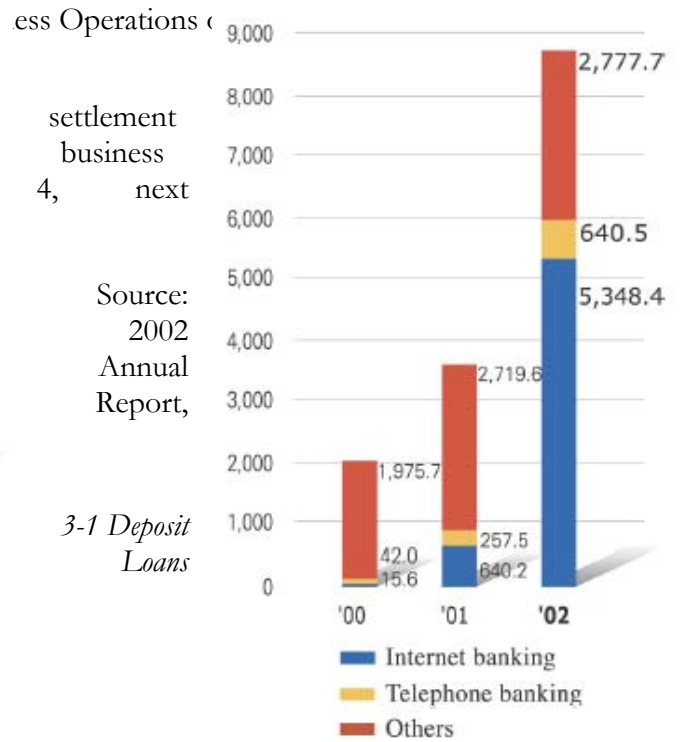
Figure  
and

Source: ICBC 2002 Annual Report, p.18

Figure 3-2 Customer Loans

### E-BANKING TRANSACTIONS

Unit: RMB billion



Source:  
2002  
Annual  
Report,

3-1 Deposit  
Loans

Source: ICBC 2002 Annual Report, p.22

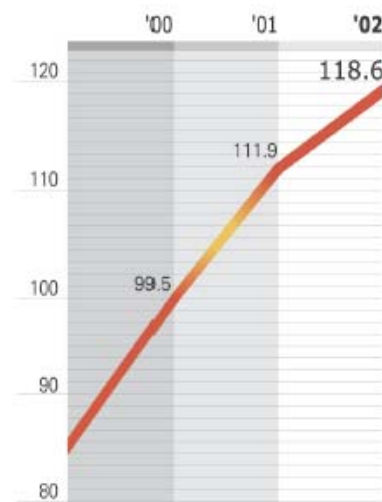
Figure 3-3 E-Banking Transaction

These business increases are part of the result of China's economic growth and the economic reform, but it's also owing to the evolutionary changes in its marketing strategy and business restructure. The annual report of 2002 reported some of these changes.

In the progress of transition towards commercial banks, ICBC has introduced some advanced marketing strategy, such as focusing on key customer segment and key customers, introduction of Customer Relationship Management system and cross-selling synergies, etc. For the business structure, it recognised that the intermediary business is the new source of income, as a result, it has been expanding dramatically and non-interest income has been increasing very fast (see Figure 3-5, next page) has been increasing greatly and the intermediary business income proportion of total income has been increasing greatly, Table 3-1 (next page) illustrates this fact.

### INTERNATIONAL SETTLEMENTS

Unit: USD billion



Source: ICBC 2002 Annual Report, p.23

Figure 3-4 International Settlement (right)

From Table 3-1, we can see that in 1999 and 2000, the intermediary business income only took 0.21 percent and 0.13 percent of the total income respectively<sup>6</sup>, but the 2001, this proportion climbed to 2.42 percent, and in 2002, 3.22 percent. Even though it is very low compared to that of the commercial banks in developed countries, it is a good start for a commercial bank in a country in transition.

Another outstanding change of ICBC is that it has established a systematic risk management system, including credit risk management, liquidity management, market risk management, operational risk and other risk management; and anti-money laundering mechanism is also part of this system.

Source: ICBC 2002 Annual Report, p.26  
Figure 3-5 Non-Interest Income (right)

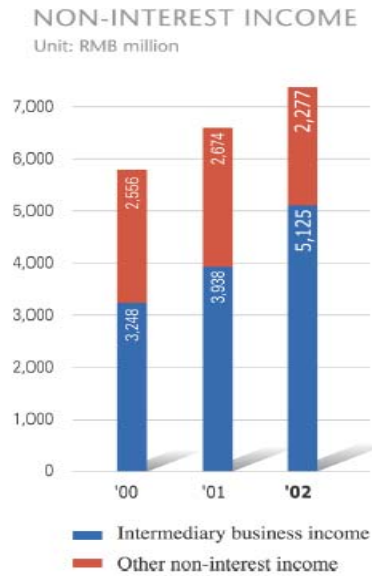


Table 3-1 Change of Income Structure of ICBC

Unit: RMB million; %

Item	1999	2000	2001	2002
1) Total Income	166672	179804	162407	159340
<b>2) Interest income</b>	166320	179579	158243	153778
Proportion of total income 1)	99.79%	99.87%	97.44%	96.51%
Interest income from loans	147173	141089	115107	117863
Proportion of total income	88.30%	78.47%	70.88%	73.97%
<b>3) Other operating income</b>	352	225	4164	5562
Proportion of total income 1)	0.21%	0.13%	2.56%	3.49%
Intermediary business income	/	/	3938	5125
Proportion of total income 1)	/	/	2.42%	3.22%

Source: All data are from the annual report of ICBC from 1999-2002, available at its webpage: [http://www.icbc.com.cn/e\\_about/index.jsp?column=About+Us%3EAnnual+Report](http://www.icbc.com.cn/e_about/index.jsp?column=About+Us%3EAnnual+Report)

<sup>6</sup> As the detailed data of intermediary business income of 1999 and 2000 are not available, and due to the fact that the majority of other operating income is intermediary business income in China's current banking industry (It is 94.57% in 2001 and 92.14% in 2002 as shown in the table), this thesis author took other operating income equal to intermediary business income of the two years.

The credit risk management system includes different schemes (ICBC, 2003, pp.28-31): the credit underwriting controls system includes internal credit policies, customer classification, and customer evaluation system and credit facility ceiling control, etc.

The loan approval scheme includes internal authorization and credit assessment and approval policy. Authorization is to avoid the risks generated from the dispersed business operation. The credit assessment is to identify the possible risks of the loan and arrange the appropriate approaches to minimize them; and approval of loan is a collective decision-making system. Based on the information systematically collected in the investigation and assessment or appraisal step, a committee made up of senior managers from different function departments will decide grant the loan or not.

The post-loan monitoring system is another scheme to identify and avoid credit risks. Regular monitoring management, off-site monitoring and on-site inspection are the main approaches, supported by a credit information system. The five-category loan classification standards have also been introduced to reveal the quality of outstanding loans.

Restructuring the loan portfolio is another strategy to minimize the credit risk. According to the national industrial policy and based on the results of internal customer assessment, risk analysis and exposures, ICBC is trying to withdraw from some high risk customers, even some industrial sectors.

Internationalization is a strategic decision of ICBC. By the end of 2003, ICBC has established eight overseas branches or share-holding companies in Hong Kong, Macau, Seoul, Busan, Singapore, Frankfurt, Tokyo, Luxembourg, and Almaty and set up four representative offices in London, New York, Sydney and Moscow. It now has 70 overseas organisations and overseas assets has been accumulated to U.S. dollars 17.6 billion (ICBC, 2004, p.21).

Its participation in public welfare activities is very active, such as education, sports and environmental protection. It was the first to grant college or university student loans to help those suffering from poverty, and ICBC and its employees donated RMB 25.92 million (equal to 3.16 million US dollars, at rate of RMB8.2/USD, hereinafter the same) in 2002 to environmental protection programs (ICBC, 2003, pp.40-41).

## 4 ICBC's Project Loan Appraisal Policy

ICBC, as a commercial bank in China, should operate its business within the framework of the relevant laws and legislation, such as The Law of the People's Republic of China on Commercial Banks and others regulating corporate activities as juridical persons. In China, the National Development and Reform Commission also play an important role; its industrial policies serve as directives of different industrial sectors. The commercial banks in China should follow the industrial policies to ensure the implementation of the national economic policies and the achievement of goals set for economic development. Regulations and policies made by the PBC, and the CBRC are also directives for the commercial banks business operations. Besides, commercial banks in China, their head offices make their own policies to direct their branches in business operations. In this part, the author addresses ICBC's project loan policy and clarifies the problems it has, from the perspective of environmental considerations. To help the readers understand the general background of this policy, the fixed assets management mechanism is presented.

### 4.1 Fixed Assets Investment and Project Loan in China

Fixed assets investment is the fund invested by the corporation to modify, develop and purchase fixed assets, such as equipment facilities, land or buildings, etc.<sup>7</sup>, to enlarge the production capacity and hence to increase the demand for raw materials and resources such as water and energy; hence, it has far-reaching influence on the national economy. That is why it is regulated in different ways in different countries. In China, it is regulated in the following ways:

The first way is official approval. According to the regulations in China, all fixed assets investment must be reported to the authorities for approval; no project could be commenced before approval. To get the approval, the project proprietor is required to propose the project and draft the project proposal report and submit it to the authorities. Another aspect is the minimum non-debt capital fund requirement. The Chinese authorities allocate different portions of non-debt capital fund for projects of different industrial sectors, according to the national economic development plan and goals<sup>8</sup>. For example, for transportation and coal projects, the minimum is over 35 percent; for steel and chemical fertilizer projects, it's over 25 percent, and for others, it's 20 percent (ICBC, n.d.-a). This means for each project, whether it needs to be financed by the banks or not, the project proprietor has to have a certain portion of its own capital first, which is no less than the portion required, depending on its industrial sector.

There are also indirect measures, which have great influence on fixed assets investments, such as reserved ratio of deposit for commercial banks that can decrease the ability for commercial banks to finance projects (Xu, 2004, Feb. 11) and interest rate, which can increase the financial cost of the project and squeeze the margin of profits. But this kind of conventional monetary policy tools has a time lag to work efficiently. That is why the Chinese authorities sometimes turn to administrative measures. For example, on recognition of the problems of overcapacity and over investments, and the problem of unreasonable and poor copy-cat projects in some

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<sup>7</sup> It also includes the investments in infrastructures, such as water conservancy, road construction and energy supply facilities, etc.

<sup>8</sup> It's a policy of the State Council of PR China, developed in August, 1996. The purpose of this policy is to control the scale of fixed assets investment of different industrial sectors according to its industrial development plan. This policy is available in Chinese at: <http://www.gdchenghai.gov.cn/zsyj/gwy.htm>.

industrial sectors such as steel, aluminium, auto, real estates and cement, the Chinese authorities, increased the reserve ratio for commercial banks from 6 percent to 7 percent in August 2003, and called, in February 2004, on the financial industry to tighten their reins on lending to the over-invested industries (Xu, 2004, Feb. 11). ICBC gave a quick response on the next day, stating that it would reduce its lending target for the year and control loans to the above-mentioned over-invested industries (Zhang, 2004, Feb. 12). As the firms in China cannot generate so much net cash flow to support the investment in fixed assets, they have to depend on banking loans. Of course, not all the projects need to be financed by the banks. There are four main sources of fixed assets funding in China: state budget appropriations, self raised funds, domestic loans and foreign investment (Laurenceson & Chai, 2001, p.215). The proprietors always try to raise as much as possible self-owned non-debt capital and other low cost funds, but a significant fact is that, from the nationwide point of view, 50-60 percent of the fixed asset investments depend on bank loans. Thus it can be considered the best way to control loans to contain the excessive investment, as commented by Wang Yuanhong, a senior analyst of the State Information Center (Zhang, 2004, Feb. 12), whether by means of monetary tools or administrative measures.

## 4.2 ICBC's Project Loan Business and its Project Loan Appraisal Policy

### 4.2.1 ICBC's Project Loan Business

Project loans are one dominating corporate banking business of ICBC to meet the borrower's need of fund investment in fixed assets or technology development, for such projects as new construction, expansion, reconstruction, science and technical development and acquisitions. They are called fixed asset loans or technical development loans, depending on their purpose (ICBC, n.d.-b).

Since the establishment of ICBC, project loans have been a comparatively large share in its loan business; this changed to some extent, but in the year of 2001, project loans were 20.3% of the total loans at the end of the year (ICBC, 2002); at the end of 2002, they were 22.8% of the outstanding loan (balance) of RMB 2,957.8 billion, and 41.9% of RMB 298.4 billion total incremental loans and 60.8% of the total incremental corporate loans of the year (ICBC, 2003, pp.15-17). This originated from the increasing demand for fixed assets investment with the rapid economic growth in China in the past years.

The project loans are long-term loans, ratified at one time and payment effected by instalment according to the plan and schedule of the projects. This requires that the lender must face different risks and uncertainties, such as changes of policies or legislation, changes of markets and industry, internal changes within the organization of the project proprietor, etc. To minimize the risks and negative effects of uncertainty, ICBC has developed various measures to identify and manage the possible risks within this business, such as Internal Credit Rating Mechanism, Customer Classification and Ceiling of Credit Facilities, Authorization and Post-loan Monitoring System, Provisions on Collateral Management (ICBC, n.d.-f), Provisions on Fixed Asset Loans and Provisions on Fixed Assets Project Loan Appraisal, etc.<sup>9</sup> All these act as integrated parts of the overall loan management policy system of ICBC and they are dependent on and supportive of each other. The latest, fixed assets project loan appraisal

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<sup>9</sup> Of course, these measures also apply to other loans such as working capital loans; they serve as the benchmark of the loan business of ICBC.

provision is considered the most important measure or tool to help identify the potential risks and to help the bankers to make loan decisions.

#### 4.2.2 Procedure

According to the Provision on Fixed Assets Loan of ICBC (ICBC, 1999), officially registered enterprises, undertaking units or other economic organizations can apply for fixed assets project loans from the ICBC. The whole process is divided into five steps: application and acceptance, review, appraisal, checkup and approval, lending and repayment (see Figure 4-1, next page) (ICBC, n.d.-c).

##### 1 Application and Acceptance

The corporation, which is in need of a loan on fixed assets, will present its application to the local branch of ICBC, normally to its corporate business department, after initial contact, together with the required documents such as official approval of the project, application of loan, audited financial statements, project proposal and others if required.

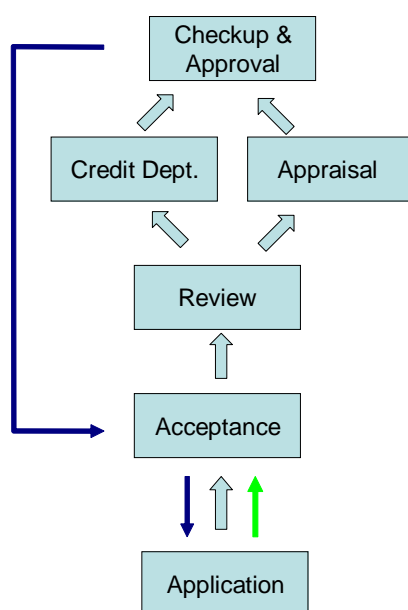


Figure 4-1 Process of Fixed Assets Project Loan

Source: Adapted from Provision on Project Loan Operation of ICBC (ICBC, n.d.-d)

##### 2 Review

The corporate business department of accepting local branch of ICBC will initially review the application and documents, to see whether the applicants have strong repayment capacity, good reputation and management system, its position in the industrial sector; whether the project meets the national industrial policy and the minimum requirement of non-debt capital fund; whether it meets the loan policy of ICBC and its market position, etc. On the basis of the review, the local branch will decide whether the application is acceptable.

### 3 Appraisal

If the application of loan considered acceptable, the corporate department of the local branch will submit the application with its own initial opinion to the credit department and the project loan appraisal department of the superior branch, which is authorized to approve the loan, with its own opinion; and a team of project appraisal will be designated to take the responsibility of project appraisal commitment. This is addressed, in detail, in the section.

### 4 Checkups and Approval

The completed project loan appraisal is presented to the credit department, which will check the report and provide the initial opinion of the local accepting branch and decide to approve the loan or not; when necessary, joint assessment is involved in this step.

### 5 Lending and Repayment

On the approval of the project loan, the local branch of ICBC will realize some pending conditions in the contract between itself and the borrower, such as the guarantee of the loan, etc. and effect lending by instalment according to the contract and the schedule of the project, and get the money back on time, both the principal and the interest. During this step, regular and irregular monitoring is required to ensure that the loan is utilized for the purpose of the contract and possible risks can be identified at an early stage.

#### **4.2.3 ICBC's Project Loan Appraisal Policy**

The body of this policy is the ICBC Fixed Assets Loan Appraisal Provision (we call it project loan appraisal policy hereinafter)(ICBC, 1997; some information in English also referred to: ICBC, n.d.-c), supported by provisions such as the above-mentioned Provision on Fixed Assets Loans, ICBC Loan Guarantee Management Provision (ICBC, 1997a) and other provisions, etc.

According to the Provision on Fixed Assets Loans of ICBC, investigations and appraisals should be carried out for the project loans, which are considered acceptable to ICBC after initial review. The project loan appraisal policy serves as the directive of appraisal. It aims to provide impersonal, impartial and accurate results, which are achieved by quantitative and qualitative analysis in the comprehensive and systematic appraisal process, to support decision making of project loans, to enhance the management of fixed assets loans and ensure the quality of appraisal work and hence prevent the risks and improve the efficiency of loans.

This policy covers four parts: general provisions, basis and conditions, factors of appraisal and documentation of the appraisal report. For the purpose of this paper, the author addresses the part of the basis and conditions and the part of factors of appraisal, as described in the general provisions section.

#### 1 Basis of loan project loan appraisal:

The appraisal work is carried out on information about relevant laws and regulations, national industrial and tax or fiscal policies, national and industrial design standards and parameters on feasibility study, national or local government regulations in relation to municipal construction layout, environmental protection, fire control, security and health, transportation, labour protection, etc., all these will provide framework or criteria for the appraisal; for the project, the official approval document, the project feasibility study report and authorities' demonstrative opinions should be provided to facilitate ICBC's appraisal work; credit policies

of both the central bank and ICBC itself, provision and parameters of loan appraisal set by ICBC are also criteria to follow; for the borrower, information on its business operations, products and markets and its financial statements are also needed.

## 2 Conditions for appraisal:

According to the project loan policy, the project loan appraisal will be carried out only when the following conditions, which are checked in the initial review, are complied with: a) the project meets the relevant regulations of national industry and product policy and is approved in the appropriate procedure and the feasibility study report has been demonstrated by authorities; b) It complies with the credit policy both of the central bank of ICBC itself; c) its financial status meets the requirement of the State and ICBC; d) documents and materials required are presented, including the official authentication of the environmental protection resolution.

## 3 Factors of appraisal

The factors of project loan appraisal range from assessment of the borrower, the project, market and investment to the assessment of repayment capacity of the borrower and risk and effects of the loan.

1) The assessment of the borrower focuses on its history, image, product and its position in the industrial sector; its management conditions and ability of the top management, technical conditions, financial status, the characteristics of the industrial sector and the future of the company and the industrial sector are also assessed.

2) For the project itself, the necessity and its background, and purpose are assessed: what are the relevant policies and how they influence the borrower and the industrial sector? What is the to-be-adopted technology? How advanced is the technology and why use it? Does the borrower have the right capacity to use this technology? Is the supply of raw materials and energy reliable to ensure the production? Can the infrastructure, such as transportation and other supportive facilities, of the site where the project is situated meet the needs? Can it meet the principle of scale of economy? For [environmental issues associated with the project](#), does it have officially approved resolutions of environmental protection? [The twenty-fifth clause of the Fixed Assets Loan Appraisal Provision is the principle clause to address this facet; and there is no other detailed environmental requirement other than this clause:](#)

### *Clause 25 Assessment on Environmental Protection*

*Mainly check up whether there is an environmental protection resolution authenticated by the environmental protection authorities or not. (ICBC, 1997)*

3) For the market, concerns are mainly given to the market situations, competitiveness of the borrower and the future of the market, such as the supply and demand of the product of the project, both in domestic and abroad market, the current price and its trend in the future, the relevant trade policy and its influence; the economic life cycle of the product, current competition status such as competitors and potential ones, market share of the borrower and its main competitors both in the domestic and international markets; the market position of the products of the project and the capacity of the market, market strategy and risks, etc.

4) For the investment, the foci are mainly on the sources of funds and upon the feasibility of investment, year by year.



5) For the repayment capability of the borrower, it is based on the forecast of efficiency of the project, the cash flow statement and the uncertainty analysis are all tools commonly used, and payback time and other financial indicators are also used to forecast the trend of the company's future changes.

6) For the risk and effect, the assessment is of course made mainly from the perspective of business of ICBC itself. Risk index can be calculated to measure the overall risk level of the loan. Qualitative analysis is employed to identify the risks that the borrower may face in investment, market, supply of raw material, foreign exchange rate (if the loan is arranged in foreign currency), business operation, management mechanism, policy and trade terms. And how these risks may influence the security of the loan and how to prevent or reduce the risks are also addressed. If guarantees are involved, the feasibility should be assessed; the effect of the loan is to see how ICBC will benefit from the aspects of profitability, deposit and intermediary business by means of this project loan, other benefits such as the social benefit it will bring will also be assessed.

This thesis author wishes to emphasise that not all project loans need appraisal. According to this policy, appraisal is not required when the amount of fixed asset loans is less than RMB 5 million or 1 million U.S. dollars. In such cases, only an investigation report on the project is required to be submitted for decision-making. But for science and technology development loans, appraisals should always be performed, regardless of the amount.

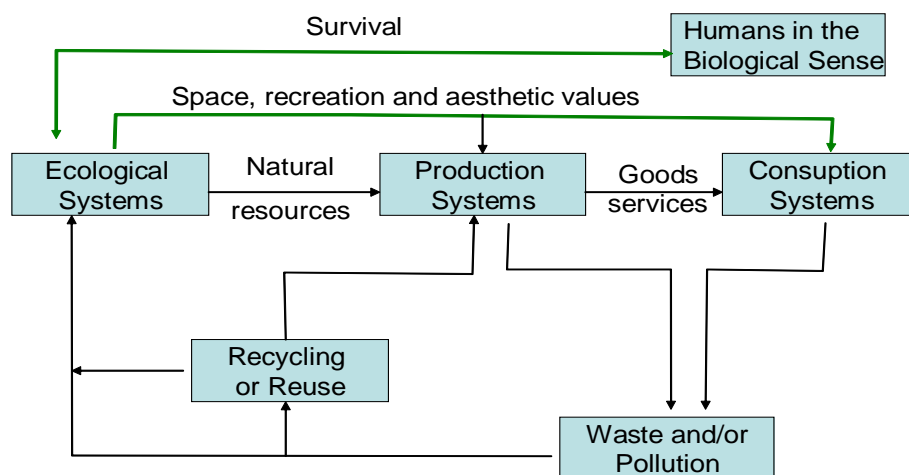
This policy has some problems from the aspect of environmental considerations. This will be discussed in depth in section six. It leaves ICBC exposed to potential threats generated from environmental issues. In section five, this thesis author provides the readers some basic knowledge on environmental issues and the environmental state in China. This aims to facilitate the in-depth discussion in section six to see how environmental issues influence the banking business especially that of ICBC due to the problems explored in the study of this section.

## 5 Environmental and Social Issues Related to Industry and Environmental Issues in China

### 5.1 Environmental and Social Issues Related to Industry

Economy and the environment are closely interrelated, Figure 5-1 illustrates the how they interact with each other (Jeucken, 2001, p.13):

The economic system is considered a sub-system of the ecological system. The ecological system provides the resources to the economic system as raw materials and energy; and it also influence the ecological systems by the aesthetic value of nature and the opportunities it affords for recreation and space, and adversely influence the ecological systems by pollution and discharge of waste; the humans are acting as the initiators of the human activities, they have to survive on the ecological systems and their actions, such as the economic activities, have both positive and negative influence on the ecological systems. The negative impact will lead to various problems to the environment and the society.



Source: Jeucken, 2001, p.13

*Figure 5-1 The Relationship between Environment, People and the Economy*

Due to lacking of consciousness of the negative impacts of human activities, with the economic development in the last century, there rose some social and environmental issues. These have been recognised recently, such as water pollution, waste, air pollution and global warming or climate change, soil erosion and degradation, desertification, energy and resource scarcity, species extinction and depletion, over population, food safety and human health, etc. It is impossible to cover all these issues in this thesis, emphasis will be placed on water pollution, air pollution, solid waste and hazardous waste, soil contamination and human health, which are related to industrial activities. And this thesis does not venture to describe

these issues in detail, only a rough description will be given to help the readers understand why concerns have been raised on these issues and how they will interact with the business of commercial banks.

### 5.1.1 Water Pollution

Some industrial sectors are featured as water intensive. Large amount of water is input in the process, including some recycling process; in return, large volumes of waste water will be generated, rich with organic and inorganic matters, suspended solids and dissolved contents, or even hazardous substance such as heavy metals. This will change the water quality chemically, biologically or physically and have a harmful effect on living organisms or make water unsuitable for desired use, which is called water pollution (Miller, 2004, p.484).

Organic matters generated from the waste water effluent from the production process, especially those from the chemical intensive process, such as sulphate and sulphite pulping and bleaching process with chlorine compounds, may cause oxygen consumption by degradation reactions in the receiving water; chlorine compounds may cause formation of persistent toxic polychlorinated compounds, such as polychlorinated phenols and dioxins, which can bio-accumulate in living organisms, as they can pass through the food webs (Miller, 2004, p.490); some extractives found in the effluents are toxic and sterols, such as resin and fatty acids. The wastewater generated from some production processes contains some high molecular weight compounds and other suspended solids, which make the water very dark in colour. The colour will block the light transmission in the receiving water and hence decrease its productivity. Some inorganic compounds, such as chlorate, formed during bleaching with chlorine dioxide, is highly toxic to algae and effects other organisms living in the algal communities; nitrogen and phosphorus may disturb the nutrient balance of the water system and cause eutrophication (UNEP, 1996, p.28): excessive supply of nutrients leading to dense growths of organisms, and the decomposition of the dead bodies of this organisms, such as algae, will need more dissolved oxygen in the water and the depletion of oxygen can cause the death of some aerobic aquatic animals such as fishes (Miller, 2004, p.490).

### 5.1.2 Air Emission

Air emissions pollutants related to industry are carbon dioxide (CO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), hydrocarbons, nitrous oxide (N<sub>2</sub>O), chlorofluorocarbons (CFCs), solvent and dust and Organic Compounds (VOCs), etc., which come from incineration or combustion of fuels in power plant and recovery boilers, or transportation vehicles exhausts or other industrial emission source (Brorson, & Larsson, 1999, p.80); particulate and unpleasant odour can also be categorised here (UNEP, 1996, pp.26-27).

Air pollution has adverse effects both on environment and human health, directly or indirectly, locally, regionally or globally; and it will cause some subsequence such as acidification, concentration of ozone in troposphere, depletion of ozone layer in stratosphere, global warming and climate change (Brorson, & Larsson, 1999, p.80).

Carbon dioxide (CO<sub>2</sub>) is the major greenhouse gas, which is mainly generated from coal-burning power and industrial plants and motor vehicles. Its increase in the atmosphere, together with other green house gases such as methane (CH<sub>4</sub>), N<sub>2</sub>O, CFCs and carbon tetrachloride, etc., will absorb some of the infrared radiation (heat) radiated by the earth's surface and warm the earth's lower troposphere and surface, leading to and enhancing the so-called greenhouse effect and hence result the effect of global warming (Miller, 2004, pp.448-450), which has negative impact on human health, biodiversity, agriculture, forest and other ecosystems such as water distribution, ocean current and sea levels, weather and climate

system – we call it climate change, etc. That is why it has been the focus of regulations, such as tradable permit or “green tax” in some countries, and the focus of such international convention and protocol as United Nations Framework Convention on Climate Change and Kyoto Protocol (Climate Change Information Center, 2003).

Sulphur dioxide and nitrogen oxides emitted into the atmosphere can be transported as much as 1,000 kilometres by prevailing wind, during which secondary pollutants will be formed such as nitric acid vapour, droplets of Sulfuric acid and particles of acid-forming sulphate and nitrate salts. These acidic substances can stay in the atmosphere for 2-14 days, during which period they descend to the surface of the earth either in the form of wet deposition such as acid rain, snow, fog and cloud vapour with pH less than 5.6, or in the form of dry deposition such as acidic particles. This effect is termed as acid deposition or acid rain, which has adverse impacts on human health, material, aquatic ecosystems, plants, soil and surface water and ground water systems (Miller, 2004, pp.428-432); VOCs consist various substances that can lead to the formation of tropospheric ozone. Both acid rain and tropospheric ozone can cause harm to the vegetation and crops. (UNEP, 1996, 27)

CFCs, known as Freon, are ozone-depletion compounds (ODCs). CFC molecules break down under the high energy UV radiation and highly reactive chlorine atoms (Cl) are released in this process; the chlorine atoms (Cl) will breakdown the ozone molecule (O<sub>3</sub>) into O<sub>2</sub> and O in a cyclic chain of chemical reactions, this causes the ozone to be destroyed faster than it is formed (Miller, 2004, pp.472-473). Each CFC molecule can stay in the stratosphere for 65-385 years (Miller, 2004, p. 473), and one chlorine atom released from the above mentioned reaction can break down 100,000 ozone molecules before it disappears (O’Callaghan, 1996, p.12). This has resulted in the ozone loss or depletion in the upper stratosphere over Antarctica. The depletion of ozone layer will allow more biologically damaging UV-A and UV-B radiation reach the earth surface, which will give harm to the human health, wildlife, food and forest, materials and even accelerate the global warming (Miller, 2004, p. 475).

Other air pollutants are particulates and odorous compounds, which have environmental impacts to the neighbourhood where the some polluting companies such as pulp and paper mills are located. Even though the unpleasant odour is not a health hazard at typical levels, its disturbance and negative aesthetic implications should be recognised. (UNEP, 1996, p.27)

### **5.1.3 Solid Waste and Hazardous Waste**

Solid waste is any unwanted or discarded material that is not gas or liquid, it is mainly generated from oil and natural gas production, agriculture, sewage sludge, and industrial activities, and municipal solid waste (MSW) only takes up a small fraction of it (Miller, 2004, p. 525). It can be considered as unavoidable by-product of economic activities, due to inefficient production process, low durability of goods and unsustainable consumption patterns (European Environment Agency, 2003, p151). Negative environmental effect of solid waste is related to its increasing amount and complexity (Brorson, & Larsson, 1999, p.96). It reflects the loss of energy and materials; besides, the management of solid waste such as classification, collection, transportation, storage, landfill or incineration imposes economic and environmental cost of the society (European Environment Agency, 2003, p.151), examples of environmental impact are emission to the air (including greenhouse gases), water and soil, with potential impact on human health and nature (EEA, 2003, p.151).

Another problem of solid wastes is that some of them are considered hazardous, which are called hazardous wastes. The definition of hazardous waste varies in different countries, in the United States, it is legally defined as any discarded solid or liquid material that:

*(1) contains one or more of 39 toxic, carcinogenic, mutagenic, or teratogenic compounds at level that exceed established limits (including many solvents, pesticides, and paint strippers), (2) catches fire easily (gasoline, paints and solvents), (3) is reactive or unstable enough to explode or release toxic fumes (acids, bases, ammonia, chlorine bleach), or (4) is capable of corroding metal containers such as tanks, drums, barrels (industrial cleaning agent and oven and drain cleaners)* (Miller, 2004, pp. 526-527).

From the definition, we can find that due to the hazardous properties of some of the substances, it can pose a threat to humans and environment in many ways, and some of them have immediate effect on the environment that can be recognised immediately when harm happens, while others only pose problems when they accumulate to a certain amount; some of them have a short-term impact and others have long-term ones (Brorson, & Larsson, 1999, p.96).

#### **5.1.4 Soil or Groundwater Contamination**

Soil has many ecological and socio-economic functions, such as filtration and adsorption, which can help, remove the contaminants from the environment (EEA, 2003, p.198). But human activities add some negative impacts on the soil, such as use of fertilizer in agriculture and military use of a site as a depot will contaminate the soil of that site. Nearly all industrial sites have potential sources of soil pollution (Brorson, & Larsson, 1999, p.46), in the process of storage, transport, handling and manufacturing. The potential pollution source examples in industry are: underground storage tanks and pipes, outdoor storage of chemicals and hazardous waste, storage sites for waste and leftover materials, loading and unloading fuel and solvents, etc., especially those lacking of constant and appropriate management or monitoring.

The contamination of soil contributes threats to the environment, human beings and the company itself (Brorson, & Larsson, 1999, p.46). For the environment, the contamination of soil may change the soil's ecosystem and its chemical and microbiological properties; halogenated organic compounds and hazardous contaminants such as heavy metals may cause especially severe effects. Another problem of soil contamination is groundwater pollution, because "Pollutants in the soil can affect the groundwater (Brorson, & Larsson, 1999, p.52)." Any leakage from storage of chemical and hazardous wastes, dump of waste into lagoons, septic tanks, landfills and deep injection wells, the dump of gasoline, oil, paint thinners and other organic solvents onto the ground are all sources of groundwater pollution (Miller, 2004, p. 493).

The problem is that the contaminated ground water does not cleanse itself as the surface water does, it will take hundreds or thousands of years for it to cleanse itself of degradable wastes; and for non-degradable contaminants, such as lead, arsenic and fluoride, are considered to be permanent, on a human time scale (Miller, 2004, p.493).

The contamination of soil and groundwater will make them not suitable for **expected** use, and it can do harm to the human health through food chain. The companies, if they are asked to clean up the contaminated soil or groundwater whether by regulation or driven by the market, have to face high costs that may threaten the existence of the companies, even though the pollution sometimes is the result of past activities on the site where they now operate (Brorson, & Larsson, 1999, p.46).

#### **5.1.5 Human Health**

Some environmental issues are related to human health problems, for example, occupational exposure to lead, cadmium, methyl, noise or radioactive materials may lead to some diseases (EEA, 2003, p.251); pollutants in the water can be transferred to human through food chain

and do harm to the human beings, food-borne diseases caused by microbial hazards are reported as growing public health problem and new hazards have emerged in food chain (EEA, 2003, p.259), and as Ian Johnson, the Vice President for the World Bank's Environmentally and Socially Sustainable Development Network of that time, mentioned in July 2001, water borne diseases and air pollution cause death of 5-6 million people every year in developing countries (World Bank, 2001).

For industries, the environmental issues generated from their production activities and products have health impact both on its workers and on its consumers.

For the workers, the health threat may come from the working environment. The relevant occupational health risks include: the physical agents such as noise, radiation and vibration, lightning; chemical and biological substances, micro-organisms; accidents such as fire and explosion; and heavy work load and repetitive tasks (Brorson, & Larsson, 1999, pp.122-123). These risks may lead to the sickness of the employees and raise the frequency of sick leave, and the accidents may result in unexpected costs, such as the time taken by the other employees in connection with the accident; the cost of hiring replacement and training them, the cost of replacing damaged equipment; and the increased insurance premiums. These costs are always two or four times higher than the visible ones, such as the wages, rehabilitation costs and insurance premium (Brorson, & Larsson, 1999, p.122). Take pulp and paper firm as example, if storage of chemicals is not handled in a proper way, or production facilities are not properly operated, fire or explosion hazard may occur in pulp and paper mills; handling chemicals, such as chloride, and noise of the production process may cause some health problems to the working staff and should be taken into considerations. (EBRD, n.d., p.2)

For the consumers, the health threat mainly comes from the products. EEA (2003, p.261) took the environmental impacts in electromagnetic fields as example to illustrate its relevant risks to human health. Even long-term low level exposures to electromagnetic fields, where the common sources include household electrical appliances and computers, may cause health effects via "chronic" impact. Low-frequency electric field may cause disease ranging from reproductive defects to cardiovascular and even neuro-degenerative disease and child leukaemia.

Another problem related to the products sometimes comes from some new technology. Genetically Modified Organisms (GMOs), for example, has involved the health and food safety concerns of the public (Vincent, 2000, p.25), although there are no scientific data available conclusively proving the benefit or detriment to humans consuming foods produced with GMOs (Susan, 2000, p.8).

## 5.2 Environmental Issues in China

There is a unanimously fact that China's economy has been increasing very fast since 1980s. Chinese has benefited a lot from its economic growth, such as the increasing income, the improving the health and education conditions and the reduced poverty level. But the growth has not been totally benign, as commented by the Energy Information Administration (EIA) of the U.S (EIA, 2003). Due to the consciousness of negative impact of the economic activity, the environmental situations in China had once been declining in the last two decades. The Chinese authorities have recognized the problem and are striving for the harmonization among high quality of environment, economic development and social development. This section will give the readers a general picture of the environmental situations in China, to help

them understand the background of the Chinese environmental policies and their future trend, and to facilitate the future discussion.

### **5.2.1 Environmental Issues in China**

Due to the huge demand of energy and resources from the large population and the urbanization, the environmental situation in China, as Minister of the State Environmental Protection Bureau of China (SEPB) Xie Zhenhua commented, is "quite stern (Randle, 2001 November 16)." The SEPB's annual report and other resources such as the World Bank report can illustrate the environmental situation in China.

The SEPB's report covers nearly all environmental issues, such as acoustic environment pollution, arable land and land resources degradation and desertification, atmospheric environment pollution, biodiversity, climate and natural disasters, forest and grassland degradation, marine and water pollution, radioactive environment pollution and solid wastes. For the purpose of the thesis, the author only focuses on water pollution, air emission, solid wastes (including hazardous waste)<sup>10</sup>, to help the readers get a picture of the environmental issues in China. Due to the availability of English version which can help the reader learn further, the data in below is from Report on the State of the Environment in China 2002 (SEPB, 2003), if not otherwise mentioned.

In its report, SEPB said in 2002, the national environmental quality was basically maintained at the level of the previous year. The population grew by 0.645% under the background 8 percent national GDP growth. The reduction of discharges of COD in wastewater, the emission of Sulfur dioxide, soot and industrial dusts in waste gases, and disposal of industrial solid wastes were reported. Progress was made, but the situations were still not satisfactory.

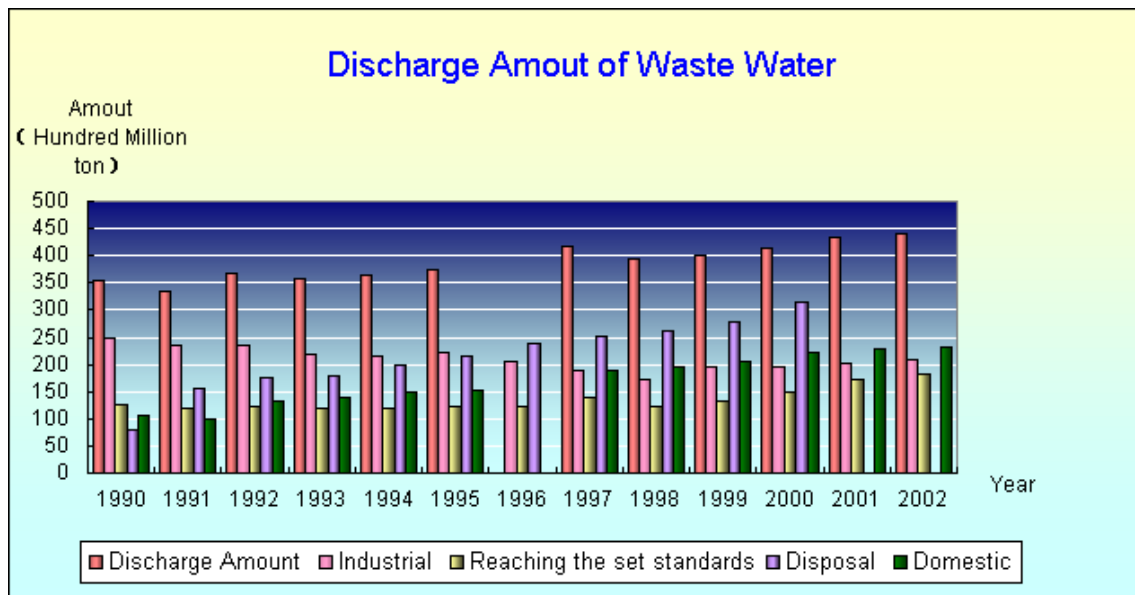
#### **5.2.1.1 Water Pollution**

In 2002, the total amount of industrial wastewater and domestic sewage across the country was 43.95 billion tons, an increase of 1.5 percent of that in 2001. The industrial wastewater discharge of was 20.72 billion tons, increased by 2.3 percent compared with that of 2001. With the discharge of wastewater, 13.669 million tons COD was discharged, decreasing by 2.7% percent than 2001. The industry accounts for 5.84 million tons of the total discharge of COD, decreasing by 3.9 percent than 2001. And 88.3 percent of the discharged wastewater met the discharging standards.

The analysis report by Environmental Information Center (EIC) of SEPA (EIC, 2004) revealed that the total amount of wastewater discharge in China has been rising from 1990 to 2002 (Figure 5-2) and the amount discharged by the industry has decreased slowly. The good news is that the amount reaching the set standards has been increasing continuously.

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<sup>10</sup> As the environmental issue in SEPB's report focus on soil erosion, information on soil contamination in China is not available.



Source: (EIC, 2004)

Figure 5-2 *Discharged Amount of Wastewater per Year in China (1990-2002)*

SEPB's report illustrated the pollution situation in seven main river basins: Yangtse River Basin, Yellow River Basin, Pearl River Basin, Songhua River Basin, Huai River Basin, Hai River Basin and Liao River Basin. They were polluted to different extents, and only less than one thirds of the river sections monitored met the requirement of water quality. Twenty-six percent of the 199 sections in the seven main river basins lightly polluted and other 27.6 percent were severe.

Water in major lakes were severely polluted by nitrogen and phosphorus, which have resulted in the problem of eutrophication, especially in the Caohai of Lake Dianchi, eutrophication was considered serious, and others like Lake Tai and Lake Chao were of light eutrophication. The water in other lakes and some inside-land lakes were reported poor by in the report.

Among the ten large reservoirs, four of them (Dahuofang, Yuqiao, Danjiangkou, Dongpu) were lightly polluted. The water pollution in three of them (Songhua Lake, Laoshan Reservoir and Menlou Reservoir) was reported severe and even worse.

Of the 218 cities and regions with ground water level monitored, 50 percent of them had the problem of drop of ground water level. Groundwater in most of the cities and regions was good in general and some parts were polluted by point or non-point sources. The polluted areas were mainly distributed in downtown area of the cities where the population density and industrialization level were relatively high. The main indicators, such as mineral content, total hardness, nitrates, nitrites, ammonia nitrogen, iron, manganese, chlorides, sulphates, fluorides and pH, exceeded the standards set by the national authorities. And the extent of pollution varied in different areas. For example, in the Northeast, North China, Northwest and Southwest regions, the main problem was that the mineral content and hardness exceeded the standards; and the problems of iron and manganese exceeding the standards were reported mainly in Northeast and South China regions. But in certain areas of some cities, the ground water quality was reported in a worsening trend.

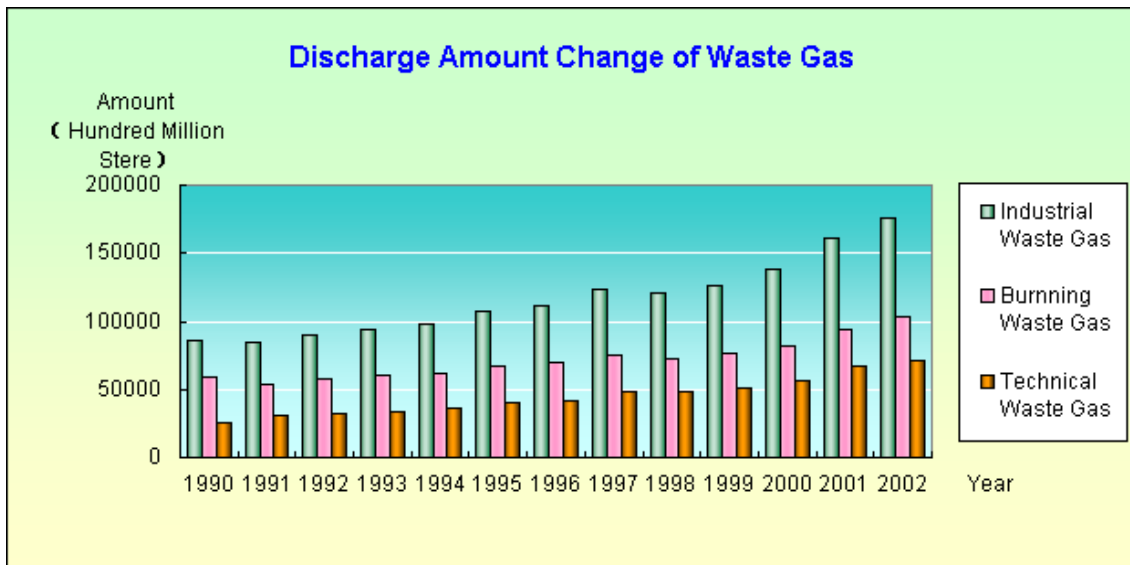


### 5.2.1.2 Air Emissions

In the report, SEPB said the urban air quality was basically stable and had an overall trend of getting improved, but in 2/3 of the cities, the air quality did not reach the air quality standard required for normal activities. Among the 343 cities and counties monitored, 35 percent (120) of them had air quality marked slightly polluted and the situations in 31.2 percent (107) of them were even worse.

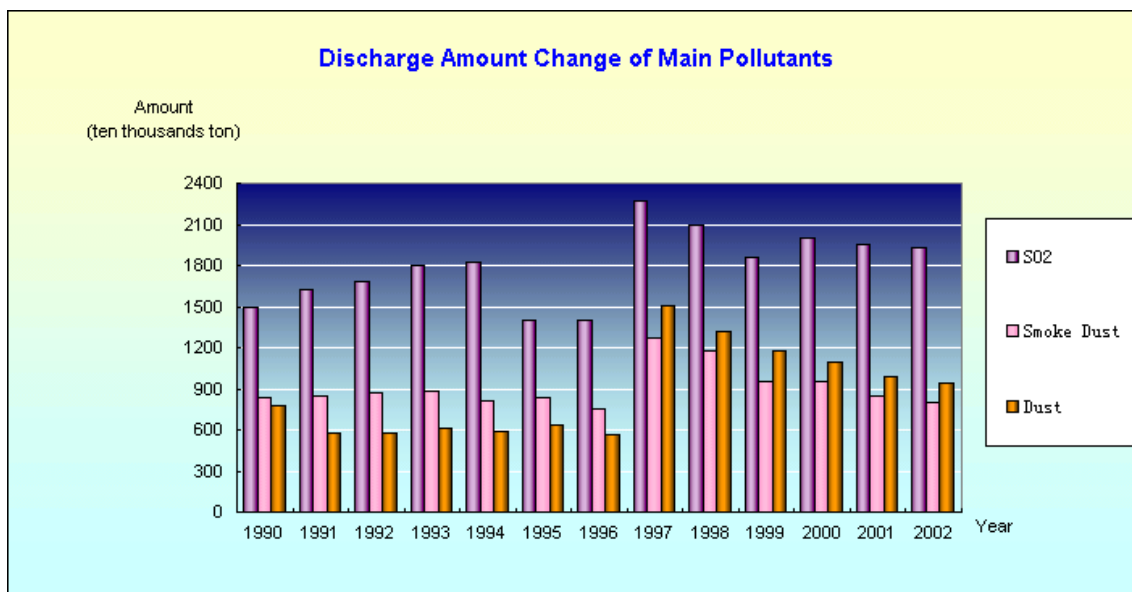
Particulate was reported the main pollutant affecting urban air quality. The particulate concentration in 63.2 percent of the cities monitored exceeded standard. The particulate pollution covered relatively large areas and the Sulfur dioxide pollution in some cities was severe. 22.4 percent of the cities had Sulfur dioxide exceeding the standard. The concentration of nitrogen dioxide reached the standard in all cities monitored, but it was relatively high in large cities. The result is that, in 2002, among the 555 cities and counties under statistics, acid rain occurred in 50.3 percent (279) of them.

The main source of air pollution is waste gas from industry. With the industrial development, the emission amount of industrial waste gas in China has been increasing gradually, The climbing speed has only slowed down after 1997, when the emission amount of main pollutants in waste gas reached highest and the Chinese authorities took measures to enhance the prevention and control the waste gases (EIC, 2004) (Figure 5-3 and 5-4).



Source: (EIC, 2004)

Figure 5-3 Air Pollutant (SO<sub>2</sub>, smoke dust and dust) Discharge Amount per Year in China (1990-2002)



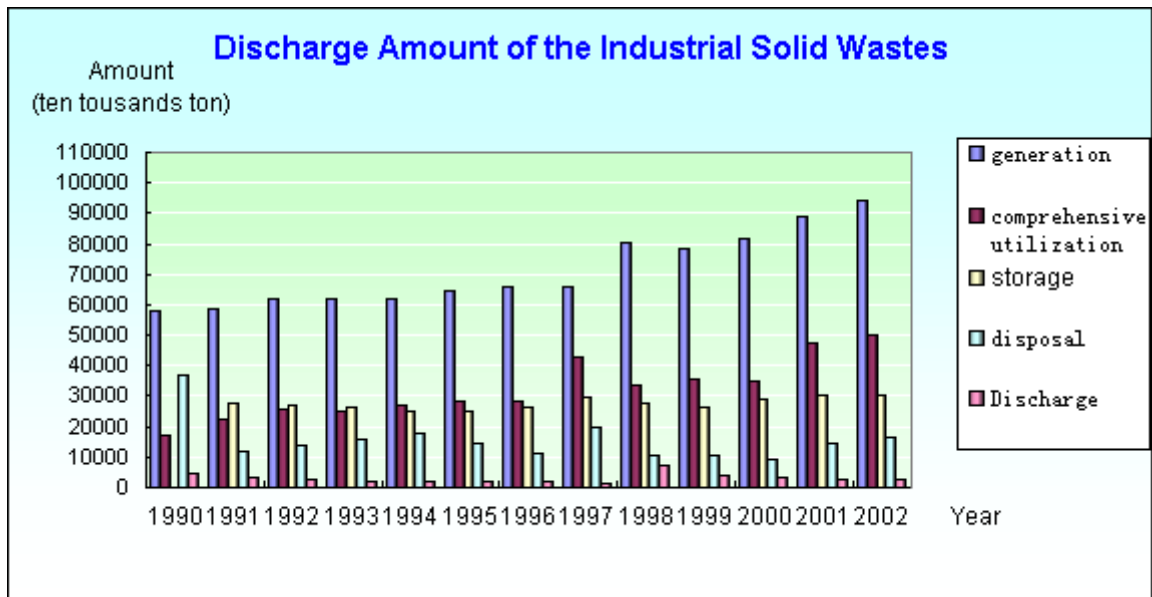
Source: (EIC, 2004)

Figure 5-4 Discharge Amount Change of Main Pollutants (SO<sub>2</sub>, smoke dust and dust) in China (1990-2002)

In 2002, as SEPB reported, the total amount of Sulfur dioxide emission in waste gases reached 19.26 million tons, and 15.62 million tons of them came from industrial sources and only 3.645 million tons was from domestic sources. The total emission of soot was 10.127 million tons, and 8.04 million tons of them came the industrial soot emission was and 2.085 million tons was the domestic soot ones. There was 9.41 million tons industrial dust emission generated totally in 2002.

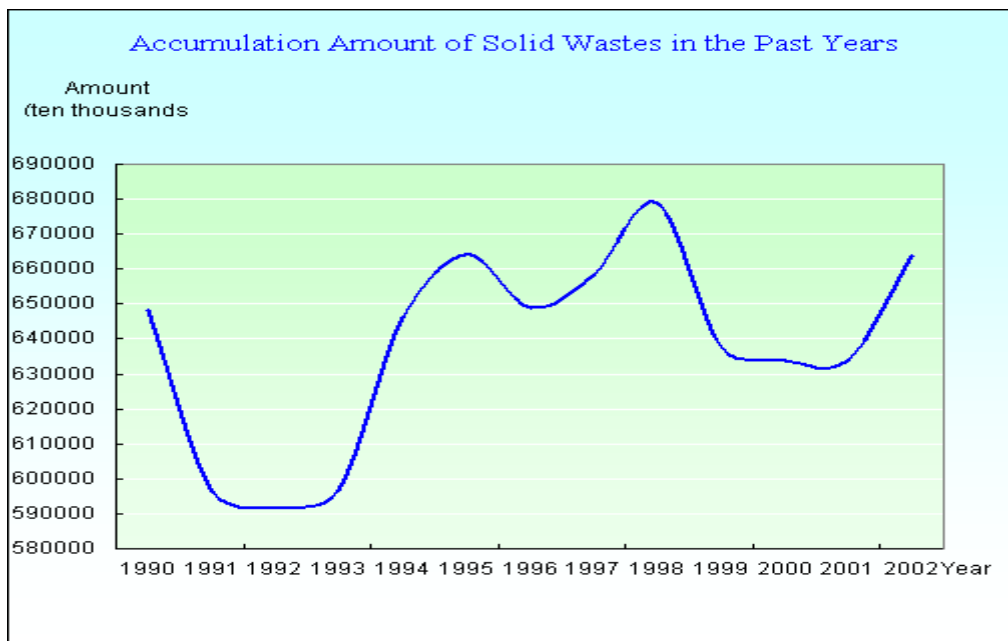
### 5.2.1.3 Industrial Solid Waste

Analysis by EIC (2004) presents that, with China's economic development, the generation of the industrial solid wastes has been increasing gradually in amount; and the generation amount of solid wastes was greater than that of disposal and cutting, and accumulation amount had increased evidently from 1993 to 1999. But due to the measures on comprehensive utilization, storage and disposal and the adoption of many new-style disposal and comprehensive utilization technology, the amount of comprehensive disposal and treatment has been increasing, resulting the amount of discharge and storage decreasing since 1995 and the accumulation amount decreasing distinctly after 1999 (Figure 5-5 and 5-6).



Source: (EIC, 2004)

Figure 5-5 Discharge Amount of the Industrial Solid Wastes per Year in China (1990-2002)



Source: (EIC, 2004)

Figure 5-6 The Accumulation of Solid Wastes in 1990-2002 in China

SEPB's report stated that in 2002, 950 million tons of industrial solid wastes was generated in China, increased by 6.5 percent than 2001. 26.352 million tons of it was discharged, 8.9 percent less than that discharged in 2001; and 52 percent of it (500 million tons) was comprehensively utilized. The report also mentioned the amount of hazardous wastes generation was 10 million tons, but no more information was given.

### 5.2.2 Costs of Environmental Issues in China

The degradation of environment costs a lot on economy, directly and indirectly. The direct economic cost of environmental issues can be revealed from some real cases.

For example, wastewater from upstream paper mills killed US\$ 3 million worth of fish for fishermen in Hebei Province; the Toxic spills killed 2 million kilograms of fish in two rivers in Anhui Province in July 2000 and caused RMB 12 million (US dollars 1.5 million) in lost catch for the local fishermen; the reduced sunlight due to sooty air depressed yields on 70 percent of China's farms by 5-30 percent; large amount of farmland are being salinised or turning into desert; pasturages are being degraded each year; topsoil erosion is causing great nutrients loss, equivalent to 54 million tons of chemical fertilizer, which is twice what China produces in a year (U.S. Embassy Beijing, 2000). SEPB stated in its 2003 report that, in 2003 there happened 1274 water pollution accidents on fishery which led to direct economic cost of RMB 0.71 billion (US dollars 85 million) (SEPB, 2004).

World Bank also gave such a picture in its report titled Clear Water, Blue Skies (World Bank, 1997):

*“Each year, an estimated 178,000 Chinese in major cities suffer early deaths because of atmospheric pollution in excess of standards.*

*Some 7.4 million person-work-years are lost annually to air pollution-related health impacts.*

*Water pollution, a major focal point of recent Chinese policy, has contaminated 52 of 135 monitored urban river sections. Such river sections do not even meet the lowest standards necessary for irrigation water, rendering them mere waste sinks.*

*Acid rain in the high-sulphur coal regions of south and southwest China has the potential for damaging 10 percent of the land area, and may have already reduced crop and forestry productivity by an average of 3 percent.*

*Children studied in Shenyang, Shanghai, and other major cities have blood-lead levels that average some 80 percent above levels considered to be dangerous to mental development. ”*

Indirect costs on economy are the costs related to issues caused by environmental issues, such as pollution-related illness or diseases, employee's illness leave and less productive on the job due to pollution, natural disasters caused by climate change, reduced agricultural output and cost increase in industrial production processes due to water pollution, etc. the U.S. Embassy Beijing (2000) stated in its report that China lost 4.5 million person-years of labour productivity due to air pollution in 1995, estimated by the World; more than a million Chinese deaths a year, one-eighth of total deaths were attributable to air pollution between 1990 and 1995, as estimated by the American Chemical Society; more than 80 percent of children aged 5-7 tested in Guangzhou in early 2000 had unhealthy levels of lead in their blood and the rate in other cities exceeded 50 percent. Lead can retard children's physical and mental development and therefore their economic productivity as adults.

This kind of cost is difficult to estimate and monetize. The brief review of some research or studies shows that the results of evaluation of economic cost of environmental degradation in China vary from 4 to 10 percent of GDP, due to the data based and the methodology employed, and some are even more than 10 percent. The World Bank, in its report Clear

Water, Blue Skies (World Bank, 1997), estimated that Air and water pollution damages, especially the damage of fine airborne particulates to human health, have been at least US \$54 billion annually or nearly 8 percent of GDP in 1995. This study employed a, 'Willingness to Pay,' approach (contingent valuation) to infer what people are prepared to pay to reduce their risk of death, which is thought logically sound (U.S. Embassy Beijing, 2000). On reflection, SEPA Minister Xie Zhenhua cited that pollution costs were 4-8 percent of GDP of China in public statements.

### **5.2.3 Achievement of pollution control in China**

The recognition of the adverse impact of environmental issues has pushed the Chinese authorities to the agenda of solving the problems. Since mid 1980s, the Chinese government started its policy making on environmental protection and progressed towards legislation, integration and harmonization (Zhang, 1999, p.10).

During this period, laws and legislation have been enacted and comprehensive regulations for the environment have been set up and the environmental protection have been integrated into the Constitution, criminal laws and other laws. Specific environmental laws have been drafted and passed, such as Environmental Protection Law, Marine Environment Protection Law, Law of Air Pollution prevention, Law of Water Pollution prevention, Law of Air Pollution prevention, Law on prevention of Solid Waste pollution, Law of Acoustic Pollution prevention, Cleaner Production Promotion Law and others. According to the laws, 361 national environmental protection standards have been established, including 11 environmental quality standards, 79 pollutant discharge standards and other standards on monitoring, sampling and basic standards. The local governments also have established their own regulations based on the law (Zhang, 1999, pp.10-11). *The Economist* commented that an environment legal framework has been created (A Great Wall of Waste, 2004, p.56).

On the national level, SEPA was established in 1998. Its role is to formulate policies for approval by the State Council of the People's Republic China (SC) and to disseminate national environmental policy and regulations, to collect data and provide technological advice on both national and international environmental issues (EIA, 2003)

The concept of sustainable development showed the new direction for the environmental protection in China. It has been written into the China Agenda 21 and has been an integrated part of the Ninth- and Tenth- Five- Year Plan (FYP). It will be the directive of law making, transaction of economic growth pattern and has been incorporated into strategy development like population strategy, resource strategy, energy strategy and consumption strategy. The Chinese central government is striving for harmonization of economic and social development and high quality of environment. (Zhang, 1999, p.13) and the current session of government is stressing the balanced development rather than all-out economic growth; and domestic public opinion on environmental issues and foreign government complain about trans-boundary greenhouse gas emissions and dust storm have been taken into considerations of decision making, as commented by *The Economist* (A Great Wall of Waste, 2004, p.56). For example, the construction plan of 13 dams along the Nu River in Yunnan province has been suspended recently due to the environmental concerns from some NGOs (A Great Wall of Waste, 2004, p.57). These internal and external pressures have become the driving forces for the Chinese government to curb the environmental issues it is facing.

China has invested a lot in pollution control and abatement. As commented by EIC (2004) in its analysis report, continuous increasing inputs in the treatments of pollution prevention and abatement projects and new projects plays a key role in the improvement of the environment.

These large-size projects will promote the environment improvement markedly. And continuous increasing inputs in the treatments of new and old pollution source and the infrastructure for urban environment are very crucial in the improvement of environment. For example, in 2003, 162.72 billion RMB (equal to 19.84 billion US dollars) had been invested in pollution prevention and treatment, increased by 19.4 percent of that in 2002. Of these investments, 107.2 billion had been invested in infrastructure for urban environment and 22.17 billion invested in industrial pollution control and abatement. In the approved 281137 new projects in 2003, totally RMB 290.64 billion (equal to 35.44 billion US dollars) will be invested in environmental protection of these projects, which accounts for 5.6 percent of the total investment. And the 115922 completed projects in 2003 will totally increase the capability of wastewater treatment by 597,700 tons per day and increase the capability of waste gas treatment 44690.72 cubic meters per hour. (SEPB, 2004)

The improvement of the environment conditions can be reflected in SEPB's annual reports. But as SEPB Minister Xie Zhenhua commented that the environmental situation in China is still quite stern. The environmental problems happened in developed countries 100 years ago and were dealt with in stages. But China's roaring pace of economic development means many of those steps is all happening at the same time here. (Randle, 2001 November 16). So it should be a challenge for Chinese government and its people to solve the problem they are meeting and to harmonize the development of economy, society and environment, towards the sustainable future. (Randle, 2001 November 16).

#### **5.2.4 Future changes of environmental policies in China**

Even though the central government has given considerable environmental concern in policymaking and strategy development, as mentioned earlier, some local governments are lagging behind in this aspect. The main concern of some local governments is economic growth, for the governors or the mayors have ambition or desire to show the superior their "political" achievements in the session of governments (normally five years), by fulfilling the economic grow goal. So environmental benefit is sometimes the auxiliary benefits (EIA,2003). In this case, the environmental dimension is only part of their policymaking, but not dominating. And the central government some time falls into this quagmire in some specific decisions. For example, when the project of the 18.2-gigawatt Three Gorges Dam was assessed, there was a lot of controversy on its feasibility, from the aspects of economy, environment, flood-taming, energy supply and military safety. It is considered as an environmental disaster in the international environment forum, due to the accumulation of toxic materials and other pollutants from industrial sites that will be inundated after construction of the dam (EIA, 2003). The environmental experts in China had once addressed this, but finally, this "environmental disaster" had been passed at the national congress. But with economic development and improvement in living standards, there should be more demand for high quality environment and more concerns shall be on environmental issues. Just as World Bank (1997) commented, "Rapid economic growth, the wellspring of rising incomes, also makes clearer waters and bluer skies more attainable." Environmental concern will be become an important dimension of decision making of governments, both at central and local levels.

The World Bank's report *Clear Water, Blue Skies* (World Bank, 1997) mentioned earlier is the environment section of the China 2020 report. Some proposals on China's future environmental policy were offered in the report.

Three ideas were suggested : to harness the market to work for the environment, not against it; to harness growth for the environment—by eliciting investments with the highest

environmental benefits for future generations; and to harness its administrative capabilities for the environment.

Economic reforms should be accelerated to ensure that the state enterprises respond to environmental penalties; that the pricing system should continually adjust to reflect cost; that international trade could allow Chinese industry can get access to the latest in environmental technology; that capital markets can provide financing to firms and municipalities supplying environmental infrastructure. The price of environmental resources such as water and energy should be raised to reflect their scarcity value. Environmental taxes were suggested to be extended to incorporate its enormous social costs. This will help clean the environment by aid of market mechanism. Better pricing mechanism should be established to makes investments in clean technology economic. This can impose an environmental discipline on the non-state sector and create market incentives for firms—both state and non-state—to invest in more efficient technologies.

The government should use its power to set better regulatory policies, regulations, and national standards and promote the policy coordination. Regulations should spread to cover township and village industrial enterprises, as markets spread. Environmental management should be launched and environmental education should aim to increase citizens' demands for a cleaner environment. Wider community participation should be enhanced in environmental policy making. The tax structure should be formulated to encourage environmental protection; preferential financial and fiscal policies, such as loans and subsidies, are needed to support the construction and operation of pollution treatment facilities or production of environmentally friendly products. These proposals will influence and has influenced the environmental policymaking in China.

The Chinese authority set high quality of environment as part of goal of the well-off society in the 21st century. The capacity building for sustainable development and the ecological environmental improvement is taken as one of the important targets. In China's Tenth Five-Year Plan for National Economic and Social Development (2001-2005, hereinafter referred as Tenth Five-Year Plan) (SC, 2001), it has been recognized that the old economic structure and crude pattern of economic growth will make it impossible to sustain resources and preserve the environment. Improving ecological conservation and strengthening environmental protection was set as one important goal of the national economic development. Environmental issues such as population, resources and the ecological environment were addressed and greater efforts were called to solve the problems, and further steps were called to be taken to implement the strategy of sustainable development, and stimulate coordinated economic and social development.

In early 2002, the 5th National Environmental Protection Conference was held in Beijing to carry out the 10th National Five-Year-Plan of Environmental Protection and to clarify the targets and tasks for environmental protection in the 10th FYP period. (SEPB, 2003)

In the National Tenth Five-Year Plan for Environmental Protection (SEPB, 2002), the Chinese authorities focus on implementation of the principles of emphasizing both pollution prevention and ecological conservation in the process of economic development. Comprehensive planning and measures were called to be taken to deal with the severe environmental situation. The principle of prevention is prioritized. The tasks and objectives are to reduce environmental pollution, contain preliminarily the eco-environmental deterioration, and to improve the urban and rural environmental quality, by reducing the total industrial pollutant discharge, ensuring the industrial pollutant discharge reaching the standards on full scale and ensuring the new pollution to be under strict control and phasing

out the backward production capacity with serious and devoting efforts to the CP. The longer term goal is to reduce emissions by 2020 to far below today's level, improve air and water quality, and to reduce pollution-related health costs to one quarter of today's level (World Bank, 1997), Which is considered as ambitious by *The Economist* (A Great Wall of Waste, 2004, p.56).

For example, compared to 2000<sup>11</sup>, the amount of SO<sub>2</sub> emission and COD discharge should be reduced by 10 percent; amount of soot emission should be reduced by 9 percent; amount of industrial dust emission should be reduced by 17.7 percent; and amount of industrial solid wastes should be reduced by 10.2 percent. To ensure the realization of these goals, comprehensive decision-making mechanism will be developed; the system of environmental laws and regulations will be improved; the governmental regulation will be consolidated with the market mechanism; input of environmental protection will be increased; incentive policy measures will be adopted; capacity building environmental management will be enhanced; researches of environmental sciences and technologies will be enhanced and the environmental protection will be turned to depending on science and technology; environmental education and publicity will be used to strengthen the environmental awareness of the public. During the five years (2001-2005), 700 billion Yuan RMB (equal to 85.36 billion US dollars) will be invested in environmental protection, accounting for about 1.3 percent of the GDP at the same period and about 3.6 percent of the total national fixed investment. Of these investments, 40 percent will be invested in Air Pollution Prevention, 38.5 percent invested in Water Pollution Prevention, 12.9 percent invested in Solid Waste Treatment, 7.2 percent invested in Ecological Conservation and 1.4 percent in Capacity Building of Environmental Protection. (SEPB, 2002)

EIA (2003) also reported SEPB was considering to adopt "polluter pays" principle and to allow for accumulation of fund for pollution abatement in the policies to be enacted, to ensure that fees charged on pollutants are higher than abatement costs. The enforcement of laws will be strengthened which, in the past were not strongly enforced or only imposed small fines on pollutant emissions exceeding the legal limit.

During the past three years, some changes have been realized. For example, targeting at electronic waste pollution and its management, Ordinance of "Extended Producers Responsibility (EPR)" on electronics has been formulated which will give birth to China's EPR system (EU-China Environmental Management Cooperation Program, n.d.).

Environmental education has been carried out at different levels. For example, the Education Ministry formulated the Direction on implementation of Environmental Education in Elementary and Middle Schools in November of 2003 (People.com, 2003, November 3). This provided the basis to integrate environmental education into elementary education. 16933 "Green Schools" have been established by the end of July 2004 (Zou, 2004, August 1). Heilongjiang Province has been approved by SEPB as the first pilot of public environmental education, aiming to disseminate environmental knowledge to the public and raise their awareness of environmental issues and protection, ethic and moral.

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<sup>11</sup> SO<sub>2</sub> emission level from fossil fuel combustion in China is 2690 Tg (Telegrams of SO<sub>2</sub>, 1 Tg=1 million tons) in 2000, reduced by 8.8 percent from 2950 Tg in 1996 ( the peak year). And total emission dropped by 7.3 percent between 1996 and 2000. This achievement is due to the radical reform of coal and energy industry; and curtailed production or shut down of factories because of economic restructuring policies. (source: Streets, David G., Jiang, Kejun., Hu, Xiulan., Sinton, Jonathan, E., Zhang, Xiao-Quan., Xu, Deying., Jacobson, Mark, Z. & Hansen, James, E. (2001). Recent Reductions in China's Greenhouse Gas Emissions. *Science*, 294, (November), 1835-1837 )



To enhance the collection, utilization and management of pollution charges in China, the Chinese authorities promulgated the new Ordinance on Collection and Utilization of Pollution Charges in 2002 (SC, 2002). The old ordinance and regulations on pollution charges had some inherent deficits, examples are: the levy objects only covered the enterprises and undertakings; only when the pollution exceeded the standards, the charges were levied, only on the factor(s) that exceeded the standards; the utilization of the collected charges was not stated clearly which made possible for the local environmental authorities to use it on non-environmental projects, such as the housing of their staff; the charge rate was not clarified. In the new ordinance, all these problems will be solved. It extended the levy objects to all polluters that discharge pollutants into the environment, which requires all polluters to pay for their pollution. The pollution charge rate and the way to calculate the amount of the charges is clearly speculated, and the charge amount is collected on the basis of pollution equivalent concentration in total. The pollution equivalent concentration takes into consideration different factors like the damage to environment of different pollutants or activities, the toxicity to organism, and the cost of treatment, it can reveal the relationship between the adverse impacts of different pollutants or discharge activities and costs of treatment. If the pollution exceeds the set standards, the charge rate will be doubled. For the collection and utilization of the charges, the ordinance requires that the charges collected should be used for the subsidy or interest refund on pollution prevention projects, new environmental prevention technology or technique development, demonstration and application; the legal responsibility is also clarified if the local authorities fail to take their responsibility to implement the ordinance. (Yimen County Environment Protection Bureau, 2003)

This ordinance employs '*pollution charges*' as an economic instrument to help reduce the pollution discharge and raise the funds needed for pollution prevention. The charge rate is higher than ever which can reveal the value of the environmental resources (Yimen County Environment Protection Bureau, 2003). It will have great influence on the polluters.

Guangdong Provincial Environmental Protection Bureau estimated, based on the calculation according to the new charge rate and way of calculation, that due to the introduction of pollution equivalent concentration to measure the pollution of different pollutants or behaviours and multi-factor involvement in the formula to calculate the pollution charges that should be collected, the pollution charges will increase dramatically. For example, in the province, the total charges on wastewater discharged from power plants over 300,000 kilowatts will increase by 89.92 percent; and the pollution charges on solid waste will increase by 452.68 percent. The direct influence is that in the coming three years (2004-2006), the pollution charges in the province will increase by 100 million RMB (equal to 12 million US dollars) every year. (Xinhua Agency, 2003)

The author got contact with Chinese environmental protection, both by telephone and E-mail<sup>12</sup>, questing on the future trend of the environmental policy in China, but no response arrived yet so far. But from above study it can be conclude that, in the coming five or ten years, environmental legislation and its enforcement in China will be further enhanced. The standards will be becoming higher and the regulation will become more stringent. There should be more and frequent change in the policy and the national standards in China will become more and closer to the international ones to help its enterprises raise their competitiveness in the international market. Economic instruments such as "green tax" or

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<sup>12</sup> The author called the Policy Research Department on 86 10 67119480 on Aug 26, 2004, Mr. Ren answered the phone call and asked the author send him E-mail to 66157873@163.com, with questions, but he reply with suggestion to relevant WebPages. [Ren, Haiping (66157873@163.com).(2004, August 28). Re: Question on Trend of Future Changes of Environmental Policies. E-mail to Liu Shengli (liushengli17@msn.com) ].

EPR will be dominate in the future, which will help internalize the environmental and social cost of economic activities and hence influence the cost of the enterprises and their competitiveness. [And there should be more public concerns on environmental issues with rising awareness and demand for higher quality of life.](#)

### **5.2.5 Challenge the Chinese Enterprises Have to Face**

The environmental issues pose challenges for enterprises. For those in China, there are some issues to be addressed in this section: to meet the environmental requirements in the international markets and to change their attitudes to and perception of environmental management.

#### **5.2.5.1 Challenge to Meet the Environmental Requirements in International Markets**

The environmental concern on the commodities in the international market is increasing. The exporting enterprises in China have recognized this pressure. Take textile as example, one third of textile products in China is exported, but due to the failure in meeting the environmental standards in the importing countries, some textile companies suffered loss, as Miss Shen (1999, pp. 125-126) of Policy Research Center for Environment and Economy of SEPB commented. She also mentioned another pressure from the eco-labelling for the Chinese textile exporters. Among the textile products, only part of the silk products were marked with eco-labels, and others were not.

Another example is about the electrical and electronic product producers and exporters. EU member countries have just finished their legislation on electrical and electronic. According to the European Union's Waste Electrical and Electronic Equipment (WEEE) Directive, each electrical and electronic equipment (EEE) producer (including the importers and distributors) is responsible for financing the collection, treatment, recovery and environmentally sound disposal of their individual products put on the market after August 13, 2005, and they must provide information needed by treatment facilities to identify the different EEE components and materials and the location of dangerous substances and preparations in the EEE; and according to Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS), by July 1, 2006, the use of hazardous materials in EEE, including lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ether (PBDE), is prohibited. An article in the newspaper China Youth (Teng, 2004, August 13) stated that this will greatly influence the export of EEE products of China and the competitiveness of the Chinese EEE producers in the international market. The article reported that EU is an increasing market of Chinese EEE products. In the first quarter of 2004, there were 9.72 billion US dollars of EEE products, which are related to the WEEE and RoHS directive, exported to EU. And the total export of WEEE and RoHS directive related products is expected to reach 50 billion US dollars at the end of 2004, and 50 billion in 2005, if it grows at this speed. But the majority of the Chinese EEE producers can not meet the environmental requirement in short term. The enforcement of these two directives will keep 12 billion US dollars outside of the EU market. Another problem is it is difficult for the Chinese EEE producers to find the substitute for the materials forbidden by RoHS; even they can find the substitute, the cost will undoubtedly be increased. To enter the EU market, the EEE producers have to pay for the waste collection and disposal charges. The cruel fact is that these kinds of charges are calculated on the human cost in the EU, which is much higher than that of China. As a result, the Chinese EEE products will loss their competitive advantages.

To accelerate the progress for Chinese EEE producers to meet the EU legislation, the Chinese authorities are working to formulate their own EEE waste management directive. The aim is to reduce the generation of EEE waste and enhance the management EEE waste. The requirement can match with that of the EU regulations and the deadline of the use of the forbidden material will also be scheduled on June 30, 2006, the same with that of RoHS (BHI.com.cn, 2004, August 2). So the Chinese EEE producers have to go faster than ever on the road towards environmentally sound products.

#### **5.2.5.2 Change the Attitude to and Perceptions of Environmental Management**

Ulrich Steger, Fang Zhaoben and Lu Wei (2003) once carried out a research study to ascertain how Chinese managers see future trend and options for their companies, with the focus on environmental aspects (Steger, Fang, & Lu, 2003, p.31). Three hundred sixteen of the 480 questionnaires were returned, with the sample covering various industrial sectors of different ownership situated in 22 provinces and municipalities (68.75 percent of the number in China). Interview was also carried out.

The result presented that 41 out of 94 interviewees had no criticism and suggestions on the environmental protection in China, attaching only minor importance to it; and the interview also reflected the managers' insufficient understanding of the comprehensive rationale behind the notion of environmental protection and the possible contribution to the bottom line (Steger, Fang, & Lu, 2003, p.25).

The interview showed that that the main drivers for improving company-specific environmental performance are corporate image, employee's health and competitiveness. This can be confirmed by the fact that only one third of the interviewees had environmental expenses budgeted and the investments of those companies with environmental budget were reported insufficient actual performance. The environmental protection was not fully integrated into their business practices (Steger, Fang, & Lu, 2003, pp.25-27).

For environmental standards, on 16 percent of the companies took higher environmental standards as opportunity for innovation; 17 percent took it as opportunity for modernization of the economy; 19 percent took it as price pay for growth; and 2 percent took it as new market. Still, there is a large proportion of them seeing it as a threat, such as it may cause a slowdown in growth, it may be a waste of investment that will affect competitiveness, etc. (Steger, Fang, & Lu, 2003, pp. 55-45). Only 5 percent of the companies had already been certified by the ISO 14000 environmental management system (EMS) by then; 19 percent of them were in the process of being certified and 41 percent of them were to be certified in two years. There was one third of them that was not familiar with it or which saw it to be unnecessary or were not intending to be certified (Steger, Fang, & Lu, 2003, p.46).

As to the measures of environmental protection, only 7 percent of the companies choose integrated pollution prevention measures, 4 percent choose recycling and reusing and another 4 percent choose substituting the hazardous materials. The remaining 85 percent relied more on end-of-pipe (EOP) technologies, other than pollution prevention or closed-loop systems (Steger, Fang, & Lu, 2003, p.46)

The report listed some reasons for these problems, such as financial constraint, lacking of capacity building (EMS support, technology-related information, training and education) are the main ones (Steger, Fang, & Lu, 2003, p.47). The top management of enterprises in China should have a good understanding of the notion of sustainable development and the rationale

behind. The awareness of the adverse environmental impact of their production activities should be raised and they should hence change their mind-set. The top management of the enterprises in China should acknowledge the benefits of CP investment. Environmental legislation and its enforcement should be enhanced. The governments, both central and local, should take their responsibilities to lead the enterprises towards “greening” their business, and encourage all relevant actors, such as financial institutions and advisory service institution, to use their power to influence the business in this aspect, by aid of legislation, education, financial and fiscal policies.

## 6 Analysis and Discussion

In this section, emphasis is placed on discussion of how environmental issues influence the business of commercial banks, from aspects of risk management and business opportunities; their challenge to ICBC due to lack of environmental considerations in its project loan appraisal policy is also discussed, and in the end, a framework for ICBC's future policy is presented.

### 6.1 How environmental Issues Influence Banking Business?

#### 6.1.1 What is environmental Risk?

There is much literatures about environmental risks, but it is difficult to find a universal definition of it. Sometimes it is referred to as “the likelihood and severity of a potential event that would have an adverse impact on the environment (UNEP FI Australasian Advisory Committee on Insurance, 2003, p.5).”For the purpose of this thesis, it is defined as the likelihood of any financial or reputational loss to the industry and the lending banks originated from any environmental and environmentally relevant issues.

The environmental issues generated from industry, as discussed in section [five](#), may cause damage to the environment, the human health and the properties. This damage may lead to prosecution for breach of legislation or for non-compliance with regulatory requirements, or lead to direction of clean-up and suspension of licence (UNEP FI Australasian Advisory Committee on Insurance, 2003, p.5); in some countries due to the absence of a sound regulatory framework, the opposition of the community public and their adoption of “a de facto regulatory role in order to protect their interests (Johnson, 2002, p.10)”. These facts have been the concerns of the industry, the investors and the financiers.

The environmental issues come from the process and production of the industry, but these issues become the sources of environmental risks in some circumstances, which can be divided into two categories: legal risks and “political” risks (UNEP FI, 1998).

Legal risks come from the legal requirement on industry, such as siting requirements to a protected environmental area or to the preparation of environmental impact statement for particular development; operating requirements on authorizations for air emission and waste discharge and on facility operations; and environmental liability on the project sponsor and on the lenders in some countries. The compliance of these legal requirements is expensive, whether the initial capital cost of the required equipment or the ongoing operating cost. Offence of these requirements may lead to fines or shut-down of a facility. The responsibilities caused by the pollution damage such as clean up of existing or future soil or groundwater contamination and the third party claims are also expensive and time consuming, the cost of which may even far go beyond that the company can afford.

Political risks come from the public concerns about the potential environmental and ecological impacts of technology on health and well-beings. The public have the ability to influence the perception of the local public, potential investors and the government authorities and hence exacerbate risks through public stunts and legal actions against developments; changing environmental requirements arising from long-term environmental issues such as climate change or new scientific findings may also influence a project.

These political and legal environmental risks may pose financial influence on major projects, such as the revenue stream, the value of the real property collateral, the timing of the projects

and the lender's shareholder equity, etc., which will subsequently influence the safety of the lenders assets if banking loans involved. This will be discussed in detail in the coming sections.

### **6.1.2 How could Environmental Risks Be Converted into Economic Risks?**

As discussed in the previous section, environmental issues can become the sources of risks in some circumstances, especially when the policy and regulation requirements change or public concern changes take place. The policy and legislation changes may result in cost increases of the products and may require the company to do clean up of contaminated sites, and thus to make additional investments to meet the requirements. The buyers and suppliers' changes in strategy may result in problems of raw materials and energy supply and product's marketing along the supply chain. The changes in public concern may lead to market changes and environmental issues may lead to great loss of reputation or image of the company, etc. In this section, some of these issues are discussed to help the reader understand how environmental risks influence the industries from economic perspectives, to support the discussion about how these issues influence the banking business.

#### **6.1.2.1 Cost Increase and Additional Investment**

Clean up costs, conversion costs, environmental damage liabilities and additional investments, whether imposed by the government or pushed by the market, all mean great cost increases in production and marketing (Jeuchen, 2001, p.120). To get the permit from the authorities and to avoid legal sanctions (especially for some environmentally sensitive sectors and when the requirement is updated), and to avoid the environmental liability related to the damaging effects to the environment caused by their activities such as ecological damage, damages to environmental property or rights or damages from the environmental nuisances or hazardous substances, the companies have to update their processing system, change their environmental requirement on raw materials, or invest in new equipments or technologies to meet the requirement, or to prevent the emerging of these damages (Jeuchen, 2001, p.124). Jeuchen (2001, p.131) illustrated a case in which a chemical substance producing company, which once had a defensive attitude to environmental issues, invested more than 150 million Euros in a new plant to meet the new environmental requirements of the government and suffered insolvency due to the fact that it could not produce the products profitably at the world market, at that time.

In China, the environmental policy system is made up of environmental law and legislation (such as Environmental Protection Law and some specialized environmental protection laws such as Water Pollution and Control Law, Atmospheric Pollution Prevention Law and others), environmental protection standards (such as waster water discharge, air and water quality), operational level systems (such as target responsibility and assessment system, strategic-tactical response and enforcement system) other laws and regulations (Such as Civil, Criminal, Economic, Labour and Administrative Laws) and international treaties (Hills, 1997, p.101). Sometimes administrative approaches are still frequently used, some of which are so stringent that sometimes this kind of approaches even lead to close up of some companies. In 1996, the State Council recognized the problem of environmental pollution and ecological degradation with the economic growth, promulgated its Decision on Issues of Environmental Protection (SC, 1996), which required closure of polluting enterprises without appropriate waste treatment facilities and those under certain scales, such as pulp and paper mills under annual production capacity of 5000 tons; existing enterprises above the scale were required to update their waste treatment facilities. According to the former State Economic and Trade Committee (SETC, it's now reformed into the State Commerce Ministry), from 1996 to 1998,

5911 of them have been closed (SETC, n.d.); and some restrictions or standards are becoming more and more stringent. For example, the Discharge Standard of Water Pollutants for Paper Industry has been updated and revised many times since the 1980s (SEPB, 1992; 1999; 2003a); [and the new ordinance on Collection and Utilization of Pollution Charges mentioned in section 5.2.4 will raise greatly the cost of pollution discharge of the polluters.](#)

To illustrate the consequences of the updated regulations upon a corporation, this thesis author refers to the case of Shandong Binzhou Huanghe Paper Group Co., Ltd, which is a large integrated pulp and paper enterprise in China. To meet the updated environmental standards and requirement on environmental protection in China, as mentioned by its Financial Manager Mr. Zhou (2004, August 10), since 1997, this company has invested more than 110 million RMB (13 million U.S. dollars) in waste treatment systems, alkaline recycle system and water recycle system. The company itself does not have sufficient cash flow for such a large amount of investment demand. The company had also had the problem of funds supply from 1997 till 2003. The company raised the capital needed by various means, such as supply from the cash flow in the operation, loan from the banks, joint venture and raised money from its employees. According to Mr. Zhou, the pulp and paper enterprises in China are mostly integrated ones; for those which cannot solve the financial problems associated with investment in waste treatment systems such as a company in Gaoqing County, have to close their pulp facilities and buy pulp from the market, but they have to pay higher pulp tonnage costs.

#### **6.1.2.2 Soil Clean Up Responsibilities**

The clean-up of the contaminated soil is a new liability posed by the governments in some countries, such as the US, UK, German and Netherlands (Jeuchen, 2001, pp.126-127). The soil pollution may stem from the past, gradual pollution or sometimes from industrial accidents. Different legal systems have different definitions of clean-up liability of the involved parties. This thesis author does not venture to detail these facts, but soil clean-up is costly and time consuming, and sometimes it even goes beyond what the companies can afford, as mentioned earlier.

In China, the polluters are also held responsible to clean up if they have contaminated the soil or water according to the Environmental Protection Law of People's Republic of China (EPLPRC). This means the companies also have the risks to be exposed to the clean up liability.

#### **6.1.2.3 Environmental Concerns and Market Changes**

The market today is clearly demand-driven. The changes of consumer patterns, such as the health concerns of end consumers, their demand for environmentally friendly products, and the buyer's environmental requirements on materials or raw materials, have great influence on the companies, if they don't adapt to these changes; if the competitors introduce an environmentally friendly strategy or product, it also means great challenges for those without such strategies and products (Jeuchen, 2001, pp.131-132): resulting in losses of sales or reduced market shares. Jeuchen (2001, p.132) used the example of Philips to present how it influences its suppliers along the supply chain on environmental performance of their products by setting its own environmental objectives, He also took *bovine spongiform encephalopathy* (BSE) in Europe as another example to show how public health concerns influenced the market.

In China, there are members of two top political organizations: the National People's Congress of the People's Republic of China (NPCPRC) and the National Committee of the Chinese People's Political Consultative Conference (NCCPPCC)<sup>13</sup>, who are working in various fields among the mass people and concern about their life and interests. In recent years, the members of the two organizations have raised concerns on environmental issues with the rapid growth of the economy in China. They have offered proposals to NPCPRC and NCCPPCC, some of which are considered proactive and strategic. One third of the proposals undertaken by the SEPB are about water environmental protection and water pollution prevention, and the others are about soil erosion, ecosystem protection, environmental quality and industry program, etc. These proposals have promoted and will promote the environmental protection from the aspect of legislation and day-to-day working. For example, in 2003, the SEPB had fulfilled 116 proposals from the members of NPCPRC among and after the first session of the tenth conference of NCCPRC and 82 proposals from the members of the NCCPPCC among the first session of the tenth conference of NCCPPCC. One of these proposals is about trans-province pollution of Zhangwei South Canal offered by the NCCPRC member Ms. Xiuxia Qu and NCCPPCC member Mr. Huijun Duan. Based upon field research among the four provinces associated, SEPB inspected the main polluter, Yinhe Paper Group and levied a fine on it for its pollution. Another proposal was serious pollution of Minjiang River offered by NCCPPCC member Keqin Hu, which led to the closure of 30 of the 62 associated chemical pulp and paper factories in the Minjiang River Basin and Tuojiang River Basin and another 25 factories there had to stop production activities. (The Environmental Management Co-operation Programme, n.d.)

The human health, food- and bio-safety concerns of GMO products have attracted the authorities in China in the recent years. In May 2001, the State Council released the Regulations on Management of Biosafety of Agro-GMO Biology (SC, 2001), and according to which the Agriculture Ministry (AM) set out some relevant ordinances to ensure the implement of it, such as Ordinance on Management of Assessment of Biosafety of Agro-GMO Biology (AM, 2001), Ordinance on Management of Import and Export of Biosafety of Agro-GMO Biology (AM, 2001a), Ordinance on Management of Labelling of Biosafety of Agro-GMO Biology (AM, 2001b), etc. According to these regulations and ordinances, the exporter should provide the importing authority with certificate from their own countries that the GMO products have been granted to be put into the market for use for some purpose, and the exporting country should provide evidence, based on scientific experiments and testimonies by the GMO technology testing authorities that the GMO products pose no damage or risks to humans, plants and animals, microorganisms and ecological environment based on this, the exporters should apply for a certificate of safety of GMO products from the Chinese authorities and label the components, origin and GMO issues of the exported GMO products. This approach has greatly influenced the supply from the world market of soybeans for some oil processing companies within a certain period in 2001 and 2002. The local production of soybeans in China cannot meet the large demand for soybeans by the oil processing companies. More than 10 million tons of soybeans have been imported every year since 1999/2000 to meet the demand. In 2001/2002, the total amount of consumption of soybean in China is 29.65 million tons, but the domestic production is only 15.45 tons, 11.50 tons were imported to fill the gap (Hehe Future, n.d.). But due to the implementation of the above mentioned GMO regulation and ordinance, the Chinese oil processing companies had to face an 80-day suspension of soybean import after April 2002, and only 0.3258 million tons

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<sup>13</sup> Of course, these organizations have their local committees at provincial, municipal and county levels, and have their relevant members at different levels. The author is working as a member of the municipal committee of CPPCC of the city where he is working.



were imported within the first six months of the year, with a 45.4 percent reduction of that of the last year at the same period (Hongtao, 2003). Some small and medium size oil processing companies and even some large ones had to stop production temporarily due to an inadequate raw material supply (China Chamber of Commerce of Import and Export of Foodstuffs, Native Produce & Animal By-Products, 2003). Mr. Pei is the Financial Manager of Shandong Bohai Oils and Fats Industrial Ltd., a large oil processing enterprise. He (Pei, 2004, August 9) stated that these regulations had influenced the material supply for a period of time, especially in the first few months after it was launched in May 2001. No company could get the certificate to import soybeans from America and Brazil. The large companies have larger stock capability and could stock for the future use in the coming months; for the medium and small companies, they had to stop production.

Haier Group is a good example of using its environmentally friendly advantage to compete with their competitors. For household electronic and electrical appliance, the adverse environmental impact mainly comes from the usage stage and post-life stage, such as CFCs coolants related ozone depletion, energy consumption and solid waste at the end of its life. On recognition of the environmental issues related to its products, Haier Group took its responsibility as a corporate citizen without hesitation and invested in research and development of new technologies to reduce the environmental impact from the stage of product design. When the public began to care about the ozone layer depletion, it invested in research and development of the CFCs substitutes as coolants for its products, such as refrigerators and air conditioners and successfully developed the first Freon-free refrigerator in China in 1993. When energy saving became a concern of the public and consumers, Haier developed and invested and adopted a series energy saving technologies, including micro-porous foaming, MSV varying-volume conservation, synchro-step duct, direct wind freezing, VIP vacuum heat-insulating shield, varying frequency, fuzzy control, artificial intelligence, etc. (Liu, 2004, p.10).

When the electronic wastes became a concern in China, as a mobile phone producer, Haier initiated the Mobile Phone Environmental Protection Campaign Proposal, and signed it on Oct. 30, 2004, together with other mobile producers and resource recovery enterprises in China. It will cooperate with resource recovery enterprises to take back the mobile products at the end of their life and to reuse or recycle the high value metals such as copper, gold, silver and palladium recovered from the waste mobiles to reduce the adverse environmental impact of them<sup>14</sup>. (EU-China Environmental Management Cooperation Program, n.d.)

Its efforts and contributions to the society have been acknowledged by the public and have overshadowed its competitors and led to Haier group's great market success. A survey of nearly 1000 stores revealed that Haier's refrigerator ranked as No. 1 in sales across 30 provinces and cities in China (Nanxiang, 2003); it has been the first selected brand of refrigerators of the consumers in China (Hailing, 2003). Haier's success in environmental strategy undoubtedly gave it an advantage over its competitors who have not introduced environmentally friendly strategies.

The adoption of energy-saving technologies helped Haier differentiate its products from that of their competitors and gained the acknowledgement of the consumers; its contribution to the environmental protection helped it build up a good corporate image and added value to its

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<sup>14</sup> The author contacted with Haier group, trying to get more information on its CSR strategy both in China and abroad (including this proposal). Miss Sun Yun answered the phone call on 86 532 8939273. She said due to internal regulations on information dissemination, she can not give more information that that in Haier Group's webpage. She suggested the author visit the webpage: <http://www.haier.com>.

brand. In 1997, it was deemed the fastest growing household electronic appliance enterprise, faster than GE, Siemens and other world famous brand (Zan, 2001).

Its success in the local market formed the basis for it to enter into the international market. On May 26, 2000, it won from the US government “the Global Climate award” for their years of excellent contribution to environment protection and refrigerator conservation (Liu, 2004, p.11); and one type of its refrigerator ranks Number 1 in sales amount in the American market of that type (Ouyang, 2003). Five Production Bases have been established outside China in America, Italy, and so on, and their refrigerators are sold in more than 90 countries and areas.

#### **6.1.2.4 Accidents**

For some industrial sectors, such as chemicals, oil refineries, basic metal manufacturing, textile, laundries, painting and petrol stations, are featured as environmentally sensitive. Continuous environmental management is needed to prevent the environmental risks, but what they have done does not guarantee lower risks (Jeuchen, 2001, p.121). Insufficient environmental management may lead to accidents, such as fire and explosion, leakage or spillages of chemicals, etc. which not only means great economic losses, but also great environmental damages or catastrophes. Brorson and Larsson (1999, p. 103) took the Sandoz accident in Switzerland as an example illustrating how accidents caused great loss both to the environment and the company itself. The on-site fire resulted in 1300 tons of agrochemicals being discharged into the Rhine, including some highly toxic insecticides, the consequence of which was an acute toxicity to aquatic species that resulted in death of fish, contamination of drinking water downstream and loss to the company both in finance and image and hence large losses in the market.

#### **6.1.2.5 Reputation or Image Loss**

Reputation or image is considered as a kind of asset of a company or other organizations, which represents the value of customers, potential customers, lost customers and other groups of people connected to the organization, because it has impact on customer perceptions of the communications and operations of the company in respect to issues such as image that can help or hinder it from communicating effectively. It can work as a filter influencing the perception of the performance of a company or it can help the customers develop expectations and experience. It also has internal impacts on the employees and external impacts on customers (Gronroos, 2000, pp.293-295). But poor performance in environmental issues may cause loss of reputation and a tarnishing of the image of a company, such as the case of the Sandoz accident in Switzerland that led to a substantial loss of reputation or image that resulted in losses of customers and market-share. It cost very much time and money to restore their image. The more involvement of internal stakeholders such as employees, shareholders and external ones such as governments, clients and suppliers, NGOs and associations can expand this kind of negative impacts and hence lead to brand erosion, criminal liability or boycotts (Johnson, 2002, p.11), and the NGO’s pressure on this kind of issues has been felt by more and more organizations, even the banking institutions (Jeuchen, 2001, p.140).

#### **6.1.2.6 Global Warming and Climate Change**

Some long-term environmental issues, such as global warming and climate change, can also be the sources of risks. The global warming and change of weather patterns result in greater humidity, widespread flooding disasters, extremely cold winters and extremely hot summers

(Loster, 2003, pp. 35-36), which have caused one trillion U.S. dollars in economic losses in the past 15 years, doubled in each of the last decades (Trevet, 2003, pp. 37-38). It can influence the shareholder value in two respects: the economic and competitive risks from climate change itself and the exposure to the regulatory and competitive implications of attempts to mitigate greenhouse gas emissions (Trevet, 2003, p. 38). Take the drought of 2001 in Canada as example, it was one of the worst droughts on record in Canada and affected water sensitive sectors from British Columbia to the Atlantic Provinces. For example, forty-five percent of prairie livestock farms were facing water shortages. The droughts also had impacts on other factors like forest, energy and transportation. It was reported that droughts increased the cost of marine transport on the Great Lakes and hydro-electrical generation fell by 36% and 29% respectively in Manitoba and Saskatchewan during 1988-89, with subsequent losses in revenue and additional expenses for generating energy from alternative sources (Abrahamson, 2002). And the hurricanes and extreme weather conditions in October 2002 forced Nexen/BP to interrupt its business in the Gulf of Mexico, as mentioned by Trevet (2003, p.38). The associated economic sectors will also be influenced by these issues along the supply chain, such as increasing the cost of the raw materials and energy, affecting the material supply due to the decrease in production.

### **6.1.3 How do Environmental Risks Influence the Banking Business?**

The banking industry, due to its position in the business life, is exposed to various kinds of risks, such as economic risks, interest risks, political risks, foreign exchange risks and credit risks. The risks of bank's business come from the risks of their clients. In the context of environmental risks, it is the environmental issues that influence the financial performance of their clients and hence reduce their repayment capacity, which may cause loss of image of the banking industry due to its financing polluting projects, and reduction of the value of its collateral. From the aspect of environmental risks on the loan business, it can be roughly divided into four categories: a. the borrower's diminishing cash flow, b. decrease of collateral value, c. the lender's liability and d. the borrower's bad-will (Lundgren, 1996, pp.129-130). Due to the fact that legal systems have different definitions of lender's liability, for the purposes of this thesis, only the first two are discussed, in detail, in this section: Additionally, the risk of reputation loss of the lenders is discussed at the end of this section.

#### **6.1.3.1 The Borrower's Diminishing Cash Flow and its Repayment Capacity**

Cash flow within one period is one of main criteria to determine the repayment capability of a borrower to the lending business. With the increasing environmental concerns of the public, government and NGOs, environmental issues can greatly impair the cash flow of the borrowers by raising costs of or additional investment for complying with the increasingly onerous environmental regulations or legislation, by raising the cost of clean-up of contaminated sites or fines or even closure for non-compliance with regulations; or by reducing the sales in an environmentally concerned market due to weak environmental performance of the products or process or damaged reputation or image (Thompson, 1998, p.130). Awareness of this fact has been growing since the late 1980s and 1990s in the banking sectors. EIAs have been an integrated part of the credit risk assessment in the lending business of some commercial banks. American banks, for example, were the first to consider their environmental policies, particularly with regard to credit risks, due to the strict liability rule in the United States. The European banks have developed their environmental policies since the mid-1990s with a focus on internal environmental care and later, on product development such as environmental investment funds (Jeucken, 2002, p.44).

But in ICBC's project loan appraisal policy and operation, this kind of risks have not been included. When environmental issues are considered, only compliance with the requirement is required to be ensured, according to the policy. This kind of ignorance of environmental issues and environmental management in loan appraisal may lead to unexpected losses. Knecht (2003, p.12) presented a real life example illustrating how a small coal mine operator faced the loss of the majority of its market when the emission limits of Nitrogen and Sulphur dioxide were significantly tightened to meet the international legislation on trans-boundary air pollution. This would result in a dramatic decrease of the sale of its products and hence lead to a decrease of cash in-flow; making it impossible to repay the loan. In China, it is difficult to get such statistical data on companies on such environmental issues, but it can be said that ICBC's lack of considerations of the impacts of environmental issues on cash flow will leave it exposed to risks to its loan business. The earlier mentioned closure of the small pulp and paper mills, for example, should have resulted in some losses to ICBC, but there are no data about it. According to Mr Zeng (June 14, 2004), an analyst of ICBC on the pulp and paper industry sector, even though by the end of September 2003, according to the official statistical data of China, there were 2716 pulp and paper mills in China, and ICBC had loan business relationships with 1350 of them at the end of the year. For the input of loans in this sector by ICBC, it's considered commercially confidential and Zeng did not mention it, but from the number of its customers in this sector, which covers about half of this sector, we can tell the position of this sector in ICBC's business operations.

### **6.1.3.2 Decrease of Collateral Value due to Environmental Issues**

To ensure their own interests, when lending to the borrowers, the commercial banks always ask the borrowers to provide guarantees or pledges for the loan, and some banks commonly use pledges or mortgages. Take ICBC as an example, at the end of 2002, 39.49 percent of its outstanding loans were for mortgages or pledge loans (ICBC, 2003, p.53). But environmental issues can adversely affect the value of the collateral pledged to the banks. The value of pledged production facilities, land or buildings listed in the balance sheet may drop dramatically due to the new stringent regulations on pollution, or due to the soil contamination (Jeuchen, 2001, p.134); and unexpected cost also inhibits the reality of the security of the loans, due to the requirement of the environmental regulations or standards. Knecht (2003, p.10) gave several examples of impact of environmental issues on valuation of bank securities. To sell a food processing plant pledged for loan and taken possession of by the bank after the borrower's bankruptcy, a Polish bank had to invest in a new boiler and one kilometre of pipeline to comply with the air quality standards.

A bank in the Czech Republic had to take the responsibility to clean up a site where a building had been pledged for the loan and taken possession of by the bank after the borrower's insolvency. This caused great loss to the banks involved. So when commercial banks evaluate the collateral of the loan, environmental issues should be taken into consideration. In ICBC's loan appraisal policy and the relevant policies, such as the Provisions on Collateral Management and the Provisions on Fixed Asset Loans and Provisions, only require that the loan seeker ensure the legitimacy and validity of the collateral and it should not be pledged over the 70 percent of the value (listed in the balance sheet). This mean ICBC is overvaluing the collateral. If the borrowers go bankrupt or become insolvent, it will suffer great losses.

### **6.1.3.3 Reputation Loss Risks**

Reputation loss risks are not listed in the four categories, but they are considered as a third type of risk (Thompson, 1998, p.129), differentiated from direct and indirect risks in the context of financial risks. This kind of risks are addressed in the following paragraphs because

the commercial banks today may suffer reputation losses due to the negative environmental impacts of the projects or businesses they have financed, even though they are not, in any case, associated with the environmentally unfriendly projects or businesses (Thompson, 1998, p.130).

The banking industry has indirect environmental impacts due to the environmental burden placed by the projects and businesses financed by it (Lundgren, 1996, p.125). This has been recognised recently by the public and the banking industry itself, as mentioned earlier; and the project finance is considered comparatively of high risk to reputation loss, especially in cases of large infrastructural investments such as roads and dams, and with new technologies such as GMOs (Jeucken, 2001, p.139). NGOs and the media are keeping a closer eye on the environmental impacts of the projects and the banking finance activities (Jeucken, 2001, p.139-140). They will not only call the government to account for the environmental impact of the industrial activities, but also direct the attention to the financiers and investors in certain projects, which will have the companies and projects attract widespread attention from the media and public concern from the public if they have negative environmental impacts, and the commercial banks, as the financiers of the projects, will also be the focus of the debate due to their ignorance of sustainable considerations and lacking social responsibilities to contribute to sustainable society, which will cause reputation or image loss to them. In the Decision on Issues of Environmental Protection (SC, 1996), the State Council of China encourages the media to disclose the breach of environmental regulations, in which the mass media, is employed as a supervision tool which is controlled by the authorities; the new information technology, such as internet, can help this kind of negative publicity expand quickly, from the local community to the larger area, even worldwide.

The problem is that the banking business is based on credit or trust. As Johnson (2002, p.11) said, "Banks attract initial investment largely on the basis of trust." The reputation or image loss is difficult to identify and financially (Thompson, 1998, p.130) but it may lead to loss of credit or trust from the public and consequently cause loss of capacity to acquire new clients and loss of existing clients,, throughout the entire business line from retail, corporate to investment banking business (Jeucken, 2001, P.139). So it will be a challenge for ICBC if it stops at only requiring an environmental permit in the process of project loan appraisal, or "acting in full compliance with the law (Thompson, 1998, p.130)."

## 6.2 How Can Commercial Banks Benefit from Environmental Considerations?

Environmental issues create risks for both industry and commercial banks, but by taking environmental issues into business operation and policy development, commercial banks can set up an early warning mechanism on risks and can enhance their risk management system. On the other hand, environmental issues also create a lot of business opportunities for the commercial banks, for example, the environmental protection business has been developed as a new sector. There is increasing demand for environmentally friendly investments like CP investments. They can develop new products to meet the needs of sustainable businesses and they can use their position as a stakeholder to influence their clients to invest in sustainable development. In section 6.2.1-2, these issues are discussed to illustrate how commercial banks can benefit from environmental considerations.

### 6.2.1 Enhance the Risk Management System

Traditionally, commercial banks make decisions on loans on financial and credit risk criteria, such as management capacity of the borrower, underlying financial fundamentals, business

plans and securities, etc. (Hamner, 2001). But with the increasing environmental concern, environmental issues have become a pressure for both the companies and the banking industry, as discussed above. This requires the commercial banks to take the environmental issues as a new dimension of risks. Bank of American, Barclays PLC and other famous international banks have set precedent in this area, by developing their own EIAs policy as part of their overall environmental policy. By the aid of this policy, they have taken environmental risks assessment as a tool of risk identification and management, which will support the decision making on loans.

There are four possible responses to deal with risks, avoid, mitigate, retain or transfer the risks, with the first two referred to risk control and the later two referred to risk financing (UNEP FI Australasian Advisory Committee on Insurance, 2003, P.3). For commercial banks, the risk management of loan is based on five blocks: risk identification, risk appraisal, risk control, transfer and monitoring (Henry, 1999), in four stages: before the loans granted, during the term of the loan, at the time of undertaking a financial workout with a defaulting borrower, and at the foreclosure and liquidation (Jeucken, 2001, p.119).

By taking environmental issues into consideration, commercial banks can set up an earlier warning mechanism of potential environmental risks and enhance their risk management system. EIAs is a good tool to do so, which is considered as “proactive” (Barannik, 2001, p.260). They can have a detailed overview of the relevant factors that may trigger the potential environmental risks into materialization, such as the framework of the relevant regulations and the trend of their changing; by evaluating the characteristic customers in various industrial sectors and incorporating the results into the customer evaluation and ranking, they can set a better direction on the future loan business on these customers; by site visit or monitoring the borrowers’ working field, their actual environmental management condition, and the attitude of the company and its top management can be revealed, etc., all these will help identify the potential risks that may arise from environmental issues at earlier stage. The most interesting issue for the lender is that the potential environmental issues addressed can be advised to the relevant companies, helping them improve their environmental management. This will inevitably influence them and their activities towards acting more responsibly (Henry, 1999) and subsequently minimize the risks from the starting point.

Take Barclays PLC for example, one aim of its Environmental Management Policy (Barclays, 2002) is to ensure its “appraisal of business customer’s borrowing propositions will include an assessment of the potential environmental risks” and “This is taken into account before approving advances.” Its Environmental Impact Assessment Policy Statement (Barclays, 1997) aims to identify the projects requiring EIA as part of the lending decision and requires all environmental issues to be assessed according to internationally recognized standards to ensure the projects’ high environmental performance. It has integrated environmental risk assessments (ERAs) policy as a tool of risk management to support its decision making on an informed basis.

Based on the risks assessment, the commercial banks can market their products under different terms and conditions, such as different loan provisions of term, credit line, interest rate and security on borrowers in different industrial sectors with different environmental performance. They can even have environmental issues included in the contract clauses to force the borrowers to meet some environmental requirement, for example, Barclays stated in its policy that “Specific measures to manage environmental aspects may be required as a condition of lending (Barclays, 2002).” This will serve as a pressure for the borrowers to take environmentally responsible actions to meet environmental requirements that may lead to

minimization of risks from the aspect of environment issues, which has obvious financial implications (Thompson, 1998a, p. 249).

And as it is shown in section 6.2.2 that, with consideration of environmental issues, commercial banks can reduce the risks to their loan portfolio by financing environmentally friendly investments such as CP.

## **6.2.2 Business Opportunities**

But commercial banks should go beyond environmental risk management; they should be sensitive to the change of this trend and take it as opportunity to expand their business in proactive ways.

### **6.2.2.1 The Environmental Protection Sector as a New Income Source**

Whether for a company or bank, continuous growth is vital to its business. For this purpose, they plan, design and carry out various programs or schemes such as marketing strategies, differentiated product and service portfolio, resource and time allocation and profitable and proactive advantage over competitors, etc., the focus of which is clients or customer, especially those who are considered valuable and contribute to a company or bank (Swift, 2001, pp.1-3). Emphasis is placed on retaining existing customers and acquiring new ones, to ensure the income resource for now and future.

The environmental concern as a new dimension to sustainable development led to the figuration of national and international laws and regulations or standards, compliance with which has become a big business (UNEP, 1994): take Canada for example, there were 4,500 small, medium and large companies running business in the environmental sector, the business of which covers environmental goods or service marketing ranging from waste management technologies to pollution filters, involving 150,000 employees and with an estimated annual market value of 11 billion US dollars; and in Germany, more than 750,000 were directly employed in the environmental products, services and protection: the market in Western Europe were estimated close to 100 billion US dollars in 1992.

In China, up to the end of 2001, there were more that 10,000 companies operating business in environmental protection sector, with more than 1.8 million employees and RMB 170 billion (equal to 20 billion US dollars) annual production value; and in the coming five years, RMB 700 billion (85 billion US dollars) would be invested in ecological construction and environmental protection which would bring about an average 15 percent annual growth of the production value of this sector, and in 2005, the total value of it will be more than RMB 200 billion ( 24 billion US dollars) (Yintong Investment Consulting Corporation, n.d.)

It can be said that environmental protection has become a newly emerging industrial sector, which is undoubtedly a new income source for commercial banks. If they are wise and sensitive to this opportunity, they can acquire and foster valuable new customers for their future business in this sector, with wise, ecologically-sensible investments and loans, as commented by Scott Vaughan, in charge of UNEP's 'Banks and Environmental program' then (UNEP, 1994).

### **6.2.2.2 New Product Development and Financing CP Investment**

As discussed in previous section, compliance with the environmental regulations has become a big business sector and a new income resource for commercial banks. Besides, the stringent

environmental regulations have forced the companies to invest in environmentally friendly technologies, equipments or projects to improve the efficiency of the material and energy utilization and improve the pollution control measures in the production process, to invest in the research and development programs to develop new products and technologies to gain competitive advantages over the competitors. For example, the Kyoto Protocol introduced three flexible mechanisms – International Emissions Trading, Joint Implementation (JI) and Clean Development Mechanism (CDM) to reduce the emission of greenhouse gases. If the financial institutions get more proactively involved in the global debate and agenda of it, there will be distinct profitable business opportunities and reputational benefits for them (Clarke, 1999). And the investments required for technical emission reductions will lead to increased demand for loans and subsequently lead to new banking business opportunities, as commented by Heinrich Huguenschmidt (1999), of UBS.

To meet this demand, the commercial banks have to develop new environmental business finance products, such as environmentally friendly loans, Brownfield redevelopment finance, environmentally sound construction finance, energy efficiency lending, environmental technology leasing, vehicle efficiency lending, information technology financing and environmental business financing (Delphi International, 1997, p.13). In this section, only CP finance is discussed, from the perspective of commercial banks.

Due to the dual environmental and financial benefit of CP to a company, as discussed in section two, CP has become a new dimension when a company is planning to invest in equipments or technologies. Financial packaging is considered as one of focal areas, which can help promote the adoption of CP technologies and practices (Visvanathan, & Kumar, 1997, pp.64-68).

For companies, especially small and medium sizes enterprises, banks are the most significant sources of finance and information (Delphi International, 1997, p.8), so they are dependent on the finance from banks and banks have greater influence on them. This provides opportunities for the banks to influence them towards sound environmental performance, such as to invest in CP to reduce the pollution level and to improve energy efficiency, by imposing a variety of conditions and covenants on their loans to the properties and projects. The most notable way banks interact with environmental issues is through corporate lending policies and operations (Thompson, 1998a, p. 243). By financing companies aware of environmental issues and effective in environmental risk management, or those committed to environmental investment or those operating in environmental sectors, banks can help to raise the environmental standards and hence benefit. To do this, they can only finance the companies which comply with the environmental standards and deny those which fail to do so; or take a partnership approach with other economic sectors to encourage borrowers to adopt sound environmental practices and to provide information assistance with their environmental risk management. The highest level for banks to utilise is to take an overtly proactive environmental stance – green marketing, such as targeting loans at businesses with superior environmental performance or those operating within the environmental technology and service sector (Thompson, 1998a, pp. 243-244).

Financing CP also offers potential benefits to banks, for example, it can improve cash flow and reduce risks and speed the return on capital or operating investment and hence reduce the risks of banks' financing business; it can also improve the image of financial institutions (UNEP, n.d.-d, p.21), by demonstrating to the public that they are socially and environmentally responsible, and this can help attract more new customers and lucrative lending propositions (Thompson, 1998a, p.224), it is a win-win game, both for companies and banks, for environment and finance.

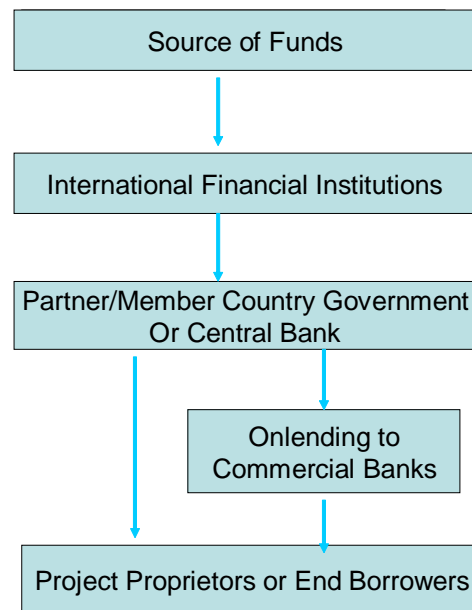


### **6.2.2.3 Intermediary as International Financial Institutions**

To take the responsibility of realizing sustainable development, some international financial institutions, such as World Bank, ADB, EBRD, have incorporated environmental issues into their business operations and are dedicating themselves in helping developing countries towards sustainable development by financing their environmentally friendly programs or projects.

ADB, for example, since the historic Earth Summit in Rio de Janeiro in 1992, has been devoting itself to helping its developing member countries in environmental protection, which is one of its five strategic objectives, and its environment agenda has evolved from impact mitigation at earlier stages to impact prevention, and now the environmental dimensions have been integrated into country operations, policy development and business operations, like targeted interventions in loan projects and programs to achieve direct environmental benefits (ADB, 2004). To help its developing member countries reduce water, air and soil pollution, ADB assists the small and medium sized enterprises to promote appropriate technologies for reduction of indoor and local air-pollution, to promote energy efficient transportation systems and to promote CP technologies and environmental management (ADB, 2001, pp.12-13). Take its environment projects business for example, in 1999, ADB approved nine loan projects of nearly \$1 billion total, to improve the environment and to conserve natural resources. Two of the projects in China had primary environmental objectives: a rehabilitation project for the Suzhou Creek to improve water quality and flood control and a loan in Shanxi Province to help solve air pollution problems in three cities (ADB, 2004a); and in 2003, \$1,488.00 million, 24.4 percent of ADB's lending business was invested in China (ADB, 2004b).

But these international financial institutions don't have their own network in the partner or member countries; they perform their business through the local governments and through the local financial institutions. Figure 6-1 (see next page) summarises the mechanism through which they work with their partners or member countries. This provides a lot of intermediary business for the local commercial banks. They borrow from the local government or the central banks and re-lend to the project proprietors or end borrowers, and collect a certain percent of commission, which is one of the main income sources for modern commercial banks today.



*Figure 6-1 Framework of Financial Cooperation between International Financial Institutions and Partner/Member Countries*

Source: Adapted from Kraft, G., 2003, p.700.

#### **6.2.2.4 Advisory Service: Advising Customers Investing in CP**

Advisory service is one of the commercial banks' intermediary services today, based on the advantage of commercial banks in information and specialists of various areas.

Commercial banks, as stakeholders of the companies, such as shareholders or lenders, have powerful influence over the management of companies (Delphi International, 1997, p.1). With environmental issues taken into consideration, the commercial banks can identify and assess the potential environmental risks and advise these facts to the borrowers, and hence help them improve their environmental management and minimise the risks by joint work with them. By communicating with the clients, the commercial banks can help them understand how environmental factors determine the outcome of their loan applications if they can improve their environmental performance (Delphi International, 1997, p.12).

The interesting issues are that valuable advice can help customers grow and hence helps build understanding, trust and loyalty between the commercial banks and their customers, which may help to promote the relationships between them to sustainable ones. In this stage, the customers, especially the small and medium sized enterprises which are lacking their own research and development systems, will take the commercial banks as their own "advisor", and this qualified position as "advisor" has more powerful influence and can create more business opportunities (Swift, 2001, p.22). For example, the "advisor" can suggest, based on its own knowledge on the benefits of CP, which its clients should proactively invest in CP programs or technologies to obtain the first mover advantage and to gain competitive advantage over competitors within its own sector. For the commercial banks, this will not only create business opportunities, but also help the customers evolve into valuable ones, from the aspect

of improvement of profitability and environmental risk reduction. This is the basis for their future business development. The following case in China illustrates this fact.

#### **6.2.2.5 Case Study: Fuyang Chemical General Works - a successful CP case**

CP plays an important role in China's environmental prevention. The Second National Conference on prevention of Industrial Pollution, the position of CP in pollution prevention, and it has been confirmed in the political documents since then on, such as the China Agenda 21, Decision on Issues of Environmental Protection by the state council. CP is required to be adopted in all projects, whatever the scale of the project is and whether it is a new project, reconstruction, enlargement or technology innovation. Today, in China, CP has been integrated into all environment related laws, policies and practice. CP pilot program has been carried out across 24 provinces and municipalities in various industrial sectors, such as chemical, pharmacy, brewery, construction, energy, food, metallurgy, petrochemical and refinery, pulp and paper, ship-building, and textile, etc. Education and training have been provided to disseminate the concept and knowledge of CP and provide the essential skills to the technicians. Institutions has been set up to direct and promote CP in China, including one national Center - the China National Cleaner Production Centre (CNCPC, established in December, 1994), four industrial sectoral Center and 16 local Center. Three sectors' CP standards has been issued; additionally, there are ten sectoral CP's drafted and another 18 are under public consultation. The enactment and enforcement of the Law of the People's Republic of China on the Promotion of Clean Production is a milestone in this process (SEPB, n.d.).

CP projects have helped many Chinese enterprises solve the problem of environmental pollution<sup>15</sup>. By introduction of CP technologies, these enterprises have successfully reduced the discharge of pollutants in the production, and on the other hand, they have been satisfied by the economic benefits of CP: cost reduction and economic efficiency improvement. Fuyang Chemical General Works is a successful case in CP project in China<sup>16</sup> (China Canada Cooperation Project in Cleaner Production, 1999).

Fuyang Chemical General Works is a fertilizer producer. Its products are ammonium bicarbonate and urea fertilizer. It is a pilot of Cleaner Production for China's fertiliser industry.

The CP project in the company was started in 1996, focusing on minimizing water consumption, efficient use of raw materials and energy, recycling of materials, improved housekeeping, and careful and safe handling of raw materials, intermediate products, and finished goods, targeting the ammonia losses to the environment. All these accounted for up to 60% of total losses of it. The aim was to improve the profitability and competitiveness while being better able to meet the pollution standards that were being imposed.

This company got technical and financial aid from the Canadian International Development Agency, Canadian engineers, process specialists, and others, cooperated by the Chinese authorities. Based on the CP audit and analysis of the production process, a detailed list of all

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<sup>15</sup> The author tried to get contact with the CNCPC staff to explore more information on the CP in China, Mr. Qi Weihong answered the phone call on 86 10 64287757 and asked the author at sent them an E-mail to [cccpc@public.bta.net.cn](mailto:cccpc@public.bta.net.cn) with questions. But the author did not get the reply so far.

<sup>16</sup> The case was prepared China Canada Cooperation Project in Cleaner Production in 1999. For the full text of the case, please refer to Appendix – 8.

environmental emissions was prepared. It indicated the sources (equipment number), the nature (stream number), the point of discharge, the general composition and the frequency such as continuous emission, intermittent emission, blow downs, periodic from maintenance, etc. Sources of environmental emissions from the ammonia/urea manufacturing were identified, including two priority process areas and seven process streams, which were responsible for up to 60% of the pollution due to the losses of ammonia to the air and to the sewer.

Since the pollution sources were identified, practical no and low cost solutions were developed to improve productivity and profitability and to reduce pollutants. Alternative schemes to recycle and/or recover these streams were prepared and analyzed. The Fuyang Plant also developed and implemented other zero and low cost CP measures in various areas of the plant operation, including housekeeping, recovery for recycling and reuse, preventing leaks of copper solution from storage. CP measures implemented are listed in Table 6-1.

By implementation of No. 1 to 6 CP measures in Table 6-1, the factory can reduce ammonia losses to the environment (air emissions and liquid effluents) 4,500 tons per year. And the total estimated net revenues generated from the recovery of the ammonia losses are about RMB 3 Million per year. The CP measure No. 7 in Table 6-1 can help the factory reduce ammonia losses to the environment 250 tons per year; and the total estimated net revenues including both ammonia recovery and sale of recovered sulphur is RMB 0.4 Million per year.

Table 6-1 CP Measure Implementation in Fuyang Chemical General Works

Stream No.	Stream Identification	CP Measures	Goal of CP Measure	Cost Category
1	Air emissions of ammonia from the mother liquor tanks	Collect air emission; and direct to a wet scrubber	Reduce atmospheric emissions.Improve occupational health Recover ammonia from air to liquid	Low cost
2	Air emission of ammonia from the bagging operation	Ventilation, air collection and scrubbing of the air at the wet scrubber	Reduce atmospheric emissions.Improve occupational health Recover ammonia from air to liquid	Low cost
3	Scrubbing liquor	Recycling at other process unit	Prevent discharge to sewer	Low cost

4	Bleed from integrative tower	Recycling at other process unit	Prevent discharge to sewer	Low cost
5	Bleed from CO/CO <sub>2</sub> trace removal	Recycling at other process units	Prevent discharge to sewer	Low cost
6	Bleed from isobaric absorber	New equipment for the concentration, recovery and reuse of ammonia	Prevent discharge to sewer Recover ammonia Reduce raw material Generate revenues	Medium cost
7	Supernatant from sulphur wastes at the gas desulphurisation area	New equipment for the recovery of sulphur, extraction and recycling of diluted ammonia	Convert sulphur wastes into saleable products Reduce losses of ammonia to the air Prevent discharge of ammonia to sewer	Medium cost
8	Ammonia condensate from the collection of contaminated air at the bagging area	Manual collection of the condensate before it reaches sewers; return to recovery	Prevent discharge to the sewer Recover and reuse of ammonia	Zero cost

Source: China Canada Cooperation Project in Cleaner Production. (1999). Fuyang Chemical General Works: A Cleaner Production Success Story (Appendix - 8)

In the first full year after implementing the no and low cost solutions, the company realized an increase in production of three percent, while saving RMB15 Million (equal to US dollars 1.8 million). The implementation of CP helped this plant become more competitive in the process, and it has successfully reduced environmental impacts, risks and potential liabilities.

For commercial banks, the CP development in China provides a good platform for the business development, such as financing CP mentioned earlier and advisory business discussed above. The customers' improvement of profitability and competitiveness will reduce the economic risks for their loan business; their growth means future value for the market in the future. The reduction of the customers' environmental impacts, risks and potential liabilities also means environmental risk reduction in their loan business portfolios. So it means that commercial banks will benefit from CP projects if they take this as a business development opportunity and help their customers grow in the future by financing their strategic environmentally sound investment and introduction of environmentally sound techniques, such as CP.

### 6.3 Problems of ICBC's Project Loan Appraisal Policy and its Challenges

The study of ICBC's project loan appraisal policy in section four revealed that that ICBC has limited environmental considerations in its project loan appraisal policy. The national and local governments' environmental law and regulation, together with others, serve as the basis for its appraisal work; officially approved resolutions of environmental protection are the main concerns to assess the feasibility of the project, and the official authentication<sup>17</sup> is an essential document to support the appraisal. But we can also find that all these provisions in the policy aim to make sure that the project proprietor has got the approval from the environmental protection authorities, this can be reflected from the twenty-fifth clause of the Fixed Assets Loan Appraisal Provision mentioned in section four.

In this case, the project appraisal materials don't have to address these issues, as the current policy requires checking up whether it has the official authentication, and this can be proved by the presentation of written papers from the environmental protection department. Just as Mr. Yu (2004, August 10, telephone interview), the Director of the Project Loan Department of the Head Office of ICBC commented that ICBC did not take it into consideration until last year (2003). And the parameters are somewhat simple and the outline is rough (not detailed). The focuses are placed on the impact of policy environment and business operation environment to see how these will influence the project proprietors in finance, such as the national and local industrial policy; fiscal and tax policy; financial policy and the character of the enterprise. For example, whether it is supportive or forbidden or to be maintained according to the industry policy, how its relevant industry will influence it along the supply chain or value chain; what is the market share and place of its product; is it a monopoly or not (monopoly is the most fragile one in the transition economy), etc. For the environmental protection policy, if the project proprietor has sufficient environmental impact analysis in its feasibility report, we can say this project is worthy to be considered; if not or it has bad environmental record, this project will be denied.

Another problem is that environmental issues do not have direct influence on the banks, only when the environmental issues are converted to economic impacts, can the banks, as lenders, recognise it, but then it's too late. So from the risk management aspect, ICBC needs a proactive tool to identify and manage environmental risk.

Even if a responsible person of the appraisal team has the awareness of environmental issues, without environmental policy or environmental impact assessments (EIAs) policy as tools and without direction or necessary capacity and skills, could he or she substantiate it? Mr. Yu (2004, August 10, telephone interview) also mentioned this problem. ICBC does not have industry and environment experts to put it in practice in detail and does not utilise the external experts and specialists to do so. He also mentioned that he is thinking about how to contribute to "green economy", even if the project proprietors have got the official authentication, the working staff of ICBC will independently assess the condition of water effluence, the waste treatment and air emission of the projects. If the project is not environmentally sound, it will not be financed. But it's only an idea or intention, because they don't have the experts and specialists needed now. When being asked: When assessing the production conditions, do the appraisal staffs consider the influence of environmental policy on supply of raw material and energy, cost and trade terms? Yu said they have initial

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<sup>17</sup> In China, enterprises are governed by governments at different levels, according to its ownership. For example, if a state-owned company is provincially governed, it should get the official authentication from the provincial authorities, such as provincial environmental protection bureau.

consideration of this issues but it's not enough and not intensive, and some branches excerpt the relevant content of the project proprietor's feasibility report, which lowers the threshold of the projects.

It can be said that ICBC has started to care about environmental issues in its project loan appraisal policy and is making progress; this is a good start. But it's too general and stops at the starting point - only the proprietor's compliance of environmental legislations and regulations is required. No proactive environmental consideration is integrated into this policy and the operations. Just as Jeucken (2001, p.140) commented, it's not enough to simply monitor or require an environmental permit. ICBC, without environmental considerations incorporated into its business operations and policy, does not match with its social responsibility it should take as a large corporate citizen, and it does not match with its strategic planning to be a modern, international commercial bank. Review via internet presents that some large commercial banks have developed their own environmental policy and have taken CSR and environmental consideration into their business operations. Examples of these banks are Bank of America, Barclays PLC, UBS, Citigroup, BNP Paribas, Royal Bank of Scotland, CSG, Mizuho Financial Group and JP Morgan Chase<sup>18</sup>. They are together with ICBC listed in the Top 1000 World Bank by *Banker*. UBS Group for example, introduced its environmental policy in 1993 and had revised in May 2004, aiming to manage the environmental risks and to take advantage of the financial market for environmentally-friendly products and services. It takes environmental issues fully into consideration and has it embedded in its culture, vision, values, and management and control principles (UBS, 2004, pp.1-2).

ICBC will lose competitiveness in the process of internationalisation if it keeps lagging behind in CSR and "greening" business. Due to the above-mentioned problems, ICBC may have to face some threats generated from environmental issues; and it will also miss some business opportunities created by environmental concerns.

### 6.3.1 Exposed to Potential Environmental Risks

#### 6.3.1.1 Potential Environmental Risks Can Not Be Fully Revealed

As discussed above, the environmental consideration in ICBC's project loan policy and practice mainly focus on making sure that the project proprietors have got the official

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<sup>18</sup> Bank of America:

<http://www.bankofamerica.com/newsroom/press/press.cfm?PressID=press.20040517.01.htm>;

Barclays PLC: [http://www.investor.barclays.co.uk/results/2000results/annual\\_report/fin\\_rev\\_38.html](http://www.investor.barclays.co.uk/results/2000results/annual_report/fin_rev_38.html);

UBS: [http://www.ubs.com/1/e/about/ubs\\_environment/environment/environmentpolicy.html](http://www.ubs.com/1/e/about/ubs_environment/environment/environmentpolicy.html);

Citigroup: <http://www.citigroup.com/citigroup/environment/initiatives.htm>;

BNP Paribas: [http://www.bnpparibas.com/en/sustainable\\_development/supplier\\_relation.asp](http://www.bnpparibas.com/en/sustainable_development/supplier_relation.asp);

Royal Bank of Scotland:

[http://www.rbs.co.uk/Group\\_Information/Corporate\\_Responsibility/Environment/Environmental\\_Report/policy.htm](http://www.rbs.co.uk/Group_Information/Corporate_Responsibility/Environment/Environmental_Report/policy.htm);

CSG: [http://www.credit-suisse.com/en/corporate\\_citizen/environmental\\_performance.html](http://www.credit-suisse.com/en/corporate_citizen/environmental_performance.html);

Mizuho Financial Group: <http://www.mizuho-fg.co.jp/english/contribution/environment/index.html>;

JP Morgan Chase: <http://www.foe.org/camps/intl/news/issue3.04.html>

authentication to show that the projects have been approved. Mr. Geng (2004, August 25, telephone interview) is an experienced bank clerk, working as the vice manager of a local branch of ICBC, responsible for project loan appraisal. He had taken part in or been responsible for project loan appraisal in various industrial sectors. He said the project loan appraisal is mainly based on literature review. The Chinese authorities issue directive categories on detailed economic sectors according to the national industrial policy, which are categorized into supported, maintained and forbidden. The categories are revised every year or two years, it depends. When the international market is assessed, the focus is put on the international trend of industrial sector of the project. The literature review starts from the future trend in the world and then limits to the detailed product of the project itself. It is carried out based on the framework provided by ICBC. The framework is based on the national industrial policy, which is keeping in line with the international trend in the world. The national industrial policy has taken the environmental protection into consideration; so for environmental issues, Geng said, the environmental effect is considered when we assess the conditions of the construction of the project, such as how could the project contribute to the environment protection. It is not necessary to write too much, maybe one or two sentences. It is mainly a qualitative analysis, no quantitative analysis. For example, we noticed that with the higher environmental protection requirement, one supportive industrial sector in the national industrial policy today might be out of support in the future. This can be confirmed by Mr Yu's comments mentioned earlier: the parameters are simple and the outline is rough.

In this case, the potential environmental risks in projects cannot be fully revealed during the appraisal. For example, what are the main environmental impacts? How will these impacts influence the project from financial aspects? What are the associated law and policies and how will they influence the financial performance? Will the pollution of the project meet the environmental standards today and in the future? Will its pollution disturb the community and hence lead to resistance of the residents? Will ICBC suffer reputation loss due to financing such a project? Without the help of environmental risk assessment policies and tools, skills and relevant knowledge and experts, ICBC's loan appraisal staff cannot identify the sources of environmental risks associated with the projects. The simple description and simple parameters are not sufficient for these purposes.

### **6.3.1.2 Static to Future Policy Changes**

Another problem is that, without proactive policies, the ICBC loan appraisal staff cannot forecast the future trends of the associated environmental policies and legislation and make preparation for future changes to properly manage the potential environmental risks. The results are static because the literature review was based on the publicized directives and the internal framework was based on the prevailing national industrial policies.

As presented in section five, in the coming years, the environmental policy in China will change faster and frequently, and will become more stringent. The higher standards and stringent legislation may cause additional investment. All these changes will greatly influence the enterprises, as discussed above. For example, the cost may be increased due to extended responsibility to take back and dispose their products at the end of life; additional investment may be required to meet the higher environmental standards; the policy change may affect the material supply within a certain period. All these will reduce the cash flow the project proprietors and hence reduce their repayment capacity. If the loan is secured by equipment as collateral, the higher standards may lead to reduction of the collateral and hence affect the asset security of ICBC.



For example, waste collection and disposal charges of EEE products in the EU market will increase the cost of producers and exporters, when the WEEE and RoHS enter into force, as discussed in section five. Chinese EEE products will lose their competitive advantage due to higher cost. This will reduce their cash flow and market share in the future. The future Chinese EEE waste management directive will also increase the cost of the producers. All this will influence the repayment capacity of the project proprietors in EEE sector.

The project loan is featured as long-term. If this situation is not taken into consideration, ICBC may be exposed to risks before the project loan has been fully repaid. For example, the project proprietors may not have sufficient cash flow to repay the loan, or have to be closed up due to insufficient capacity to meet the environmental standards. This had happened in China as mentioned earlier in the thesis. In some cases ICBC has to input more loan on the project unexpectedly.

It has to be stressed that the supported industrial sector in the directive category today may become forbidden in the coming years. Geng (August 25, 2004, telephone interview) also mentioned that small coal thermo-power plant under 50,000 kilowatts was once supported in the national industrial policy. The purpose was to encourage increase the electricity supply to meet the increasing demand. Because today, it is recognized that it is highly polluting and energy consuming, and does not match the economies of scale principle, it is listed in the forbidden category.

So when ICBC's project loan appraisal staff work on projects in EEE sector, this change and its influence should be proactively evaluated and taken into risk management considerations. If ICBC has a proactive policy with environmental considerations, it will direct its loan appraisal staff further detect the potential risks behind the projects in their work. Such kind of potential risks can be explored proactively and prepare alternatives to avoid or manage them. For example, if a supportive industrial sector today may become maintained or forbidden in the future, ICBC should arrange a shorter term of the loan, or delete this sector from the supportive categories in advance of the future national industrial policy change. If the environmental standards are expected to be higher, ICBC can ask for more advanced equipment as collateral, etc.

### **6.3.1.3 Lack of Awareness of Environmental Issues and Risks**

Due to a lack of policy with environmental considerations, some of ICBC's staff has no idea what environmental issues mean to the banking business; they are not conscious of the potential risks behind the environmental issues and seldom link environmental issues with their business practices.

This thesis author once worked as a loan teller in a local branch of ICBC. The earlier mentioned Shandong Binzhou Bohai Oils and Fats Industrial Ltd is a customer of the local branch. The author was responsible for the customer evaluation and risk analysis of its business. When the State Council first released the Regulations on Management of Biosafety of Agro-GMO Biology, the company came to the bank applying for loan. According to the framework of loan appraisal, the author collected various information associated, and carried out the assessment of the customer, from the perspective of reputation, management, financial situations, market situation and the competitiveness of its products and market share, its industrial sector and its position. And an overall risk evaluation of the loan was estimated. At that time, the author recognised that the regulation would and had influence the material supply of this industrial sector in China, but did not recognise the relationship between the environmental issues and the potential risks behind. Before the release of the regulation,

GMO issues had been widely discussed in the media. But due to lacking of knowledge of environmental issues and policy as direction, either the author or his colleagues were aware of how the future policy would change and how it would influence the related industrial sectors, let alone to make preparation to manage the potential risks in the business with the related sector.

This phenomenon does also exist in other branches of ICBC. For the companies that have been closed, which were discussed in section 6.1.2.3, due to their pollution in the Minjiang River Basin and Tuojiang River Basin, they should have been closed at the first time they were found in the authorities' regular monitoring activities not able to meet the environmental requirements; or they should have been fined and required to invest in environmental protection technology or equipments to meet the environmental requirement. But why they could have discharged pollutants to the environment for such a long period and the pollution problem had not been solved until NCCPPCC member's proposal? The author tried to detect more information on the real life of this case and how the closure of these companies has influenced the business of the local ICBC branch. But due to the fact that the author's identity could not be authenticated on telephone, the person who answered the telephone was not willing to answer the author's questions. But he commented that they care more about the security of assets. And for the polluting issues, nobody can give a clear explanation (Kang, 2004 August 25, telephone interview).

The research study by Steger, Ulrich, Fang, Haobin, & Lu, Wei (2003, pp. 25-26) gave a good explanation of this phenomenon. The environmental legislation started later than the West and there is no comprehensiveness of environmental legislation. The worst is that the enforcement of existing law and legislation is inadequate due to lacking of supervision and standardisation, and the enforcement will become weaker if unfair practice is involved in some cases, such as local protectionism and bribery. And the Chinese authorities today tend to be campaign-oriented in environmental protection. When the public and media are concerned about a case, such as wastewater effluent to the environment causing soil contamination and water pollution or leakage of waste gas or chemical staff causing air pollution soil and water pollution, the authorities will take this as an opportunity to carry out a campaign to solve the this kind of problems. The case is a typical example. The NCCPPCC member's proposal raises the awareness of SEPB of the serious pollution in that region, and the closure of those companies is the result of a campaign on this.

Adequate enforcement and supervision can prevent this kind of environmental issues like pollution in above case at earlier stage. But for ICBC, the inadequate enforcement means more uncertainty from the aspect of risk management, than the environmental risks behind the environmental issues themselves. Nobody could forecast a campaign and take measures to avoid the risks associated.

If ICBC has its policy with environmental issues taken into consideration, the fact that the waste discharge in those companies was not meeting the environmental standards and regulations could have been revealed in the EIAs. But due to lacking of such a policy, environmental issues are still not the concern of the working staff of the local branch. The relationship between the risks and environmental issues has not been recognised, as Kang's comments presented.

### **6.3.2 Loss of Business Opportunities**

Lacking of awareness of environmental issues does not only exist in risk management, but also exists in the business marketing practice.

As discussed in section five, CP in China has been integrated into all prevailing laws and policies, and it has been and will be a strategic thinking to solve the environmental problem that China is facing and will meet; and China has and is being investing large amount of capital in CP projects. CP technologies, together with other technologies, as EIA (2003) suggested, will be prioritized. So there should be more CP projects and technologies investment in the future. This means abundant business opportunities for commercial banks. But ICBC has no cooperation with CNCPC so far, as Yu (August 10, 2004, telephone interview) mentioned. Due to this fact, ICBC are suffering from loss of business opportunities.

Take the case of Shandong Binzhou Huanghe Paper Group Co., Ltd as example, as Mr Zhou (2004, August 27, telephone interview) commented, to meet the higher environmental standards then, they had to invest a lot in the pollution prevention projects; otherwise the company would be forced to close by the authority due to insufficient capability to meet the set standards. In 1997, the company decided to invest more than RMB47 million (equal to 5.7 million US dollars) in a wastewater (sewage) treatment project first in 1998 and RMB51 million (equal to 6.2 million US dollars) in an Alkaline Recycling project later. But the company could not generate such large amount of funds for the investment; they had to squeeze cash from the business operation activities. When they went to the local commercial bank applying for loan, but none of them were willing to finance such kind of projects. And due to the financial constraint, the commercial banks squeezed their credit line to the company or stopped new loan input.

The environmental and economic benefits of CP projects have been illustrated in the case of Fuyang Chemical General Works, but in this case, none of the local commercial banks recognized the importance of these cleaner production investments. And due to the lack of awareness of the environmental and economic benefits of these projects, they local commercial banks took this kind of investment as a financial burden to the companies and withdrew their business. ICBC missed that business opportunity.

The most important is that ICBC missed the opportunity to gain the first mover advantage over its competitors in customer retention and customer loyalty cultivation.

As discussed in section five, due to financial constraint and lacking awareness of the benefit of CP investment and other reasons, some enterprises in China still have not integrated environmental protection into their business operation, the majority of measures they took to reduce environmental impacts are still EOP technologies. These facts represents that some Chinese enterprises are still not ready to the real life today in which environmental issues and sustainable development have been one the main concerns, and they are not ready to face the challenge. If ICBC takes the environmental issues into considerations and has a policy to arm its staff, it can use its advisory service to influence its customers to invest in environmentally sound projects or technologies such as CP, by raising their awareness of the environmental and economic benefits of such projects or technologies and help them solve the financial problems by financing such projects. By doing so, ICBC can be the first mover in both marketing and helping customers in capacity building. It can help ICBC explore more business opportunities to market its loan business. The valuable advice can help its customers grow and hence improve the relationship to a higher level and increase their loyalty. This undoubtedly means more fruitful future market for ICBC.

## 6.4 Opportunities for ICBC to Incorporate Environmental Issues into Policy-Making and Business Operations

So it can be seen that to avoid the risks and to take advantage of the business opportunities created by environmental issues, ICBC should incorporate environmental issues into its policy development and business operations. What ICBC urgently needs is a detailed, practical policy with environmental issues incorporated to direct its future business operations. But what are the opportunities for it to do so? The environmental issues can be taken into consideration all through the process of lending business: screening, appraisal, and post-lending monitoring and management, and all these can be stipulated in the lending provisions.

Lending provisions stipulate the requirements that the borrowers have to meet and requirements the lending staffs has to follow in the whole process of the lending business. For those companies that are highly dependent on the banking loans, as mentioned earlier, such as small and medium sized enterprises, this kind of requirements makes more sense. For them to obtain finances through the commercial banks, they have to meet the requirements, by improving their financial situations and management. To incorporate the environmental issues, ICBC can have differentiated policies on projects with different environmental impacts. It can divide the projects into categories according to the potential environmental impacts of the projects and set different requirements and priorities, as the ADB (2001, p.18) and World Bank (Murphy, 1999) have done. This will serve as direction for the lending staff to rate the customers and to allocate credit lines to customers with different environmental performance and to screen the projects to finance and decide the extent and type of ERAs required, what kind of project should be prioritized, which should not be financed and which needs initial or detailed ERAs. To make sure that the projects financed will meet certain environmental standards, ICBC can, according to the prevailing domestic and international environmental regulations and standards, set the environmental standards for projects to be financed. Barclays PLC, for example, takes the attainment of World Bank standards as the minimum requirement and only lends to the projects that have satisfied the stringent criteria set by the Barclays to make sure that the environmental impacts will be properly managed (Barclays, 2003, p.12 ). The borrowers are required to complete a proposal form detailing the environmental benefits to be derived from the investment and sign a “self certification” declaration, besides meeting the usual leading criteria. NatWest also launched some environmental initiatives including environmental lending initiatives with comparative fixed rate loans for companies which are making a commitment to lessening any harmful environmental impacts (Thompson, 1998a, p.249). For the companies and projects that cannot meet these standards, they should be screened out.

For the projects with potentially serious and significant environmental impacts, ERAs should be carried out as an integrated part of the loan appraisal process to identify, quantify and mitigate, where appropriate, the environmental risks, as Barclays (2003, p.12 ) did.

All possible positive and negative impacts likely to result from the projects should be identified and assessed and possible alternatives should be proposed for the future environmental risk monitoring (Murphy, 1999). Also, an environmental assessment report should be submitted to the committee or board, which will make the decision of accepting or rejecting the environmental risks to support their decision. For the projects with medium and low level of environmental risks, it's not necessary to do an intensive ERAs, from the cost-effective point of view. The credit officers can make their own assessment of the environmental performance of the business with the aid of environmental issues checklist and environmental guidelines for industrial sub-sectors (Knecht, 2003, p.15), such as those provided by World Bank.

ICBC, as a lender, may also ask the borrowers with potentially serious and significant environmental impacts to submit environmental assessment reports of their industrial activities and the projects, and these reports should include direct and indirect impacts, environmental standards to achieve the least cost mitigation measures, the appropriate environmental management plans should be developed and monitoring requirements should be met. They should also ensure that there is meaningful public participation (ADB, 2001, p.18), to help the lenders address the main environmental issues and their impacts.

As the loan proposal is approved, in the lending and borrowing contract or agreement, the commitments for the borrowers to meet certain environmental standards and report to the lender the process and environmental performance should be clearly stipulated, to ensure that the potential environmental risks are properly managed by ensuring the financed projects meet the expected environmental standards. Sometimes the transaction is conditioned on the borrowers taking certain measures to maintain regulatory compliance and to reduce environmental risks. Only when this condition is satisfied, such as investing in new boilers, modernising bulk chemical storage facilities, or putting emergency response plans in place, etc., can the loan be provided to the borrowers (Knecht, 2003, pp.17-18). These clauses will help the lenders control the potential environmental risks. The borrowers may need extra money to invest in the new boilers or modernising bulk chemical storage facilities to satisfy the clause. In this case, ICBC should compare the amount of the extra investment and that of the project. If it is a small amount, the lender can arrange a loan for this extra investment as the precondition of the project. If the amount of the extra investment is too large or similar to that of the project, the instalment of the new boilers or the modernization of the bulk chemical storage facilities should be integrated into the new project. ICBC may seek cooperation with other commercial banks on financing the projects, if it cannot meet the large amount of demand itself or for the sake of risk transfer or apportionment.

To ensure the security of loans, in the provisions, it should be clarified what can serve as collaterals and what potential environmental impacts that will reduce the value should be identified and quantified in the process of loan appraisal. For projects, the equipment, the land and the buildings can all be used as collateral. This makes more sense for small and medium sized enterprises that are lacking of collateral to get loans (Evans & Hamner, 2003, p.647). But both equipment and land are environmentally sensitive. The former are easily affected by the changing environmental standards and the later are easily contaminated, which will reduce the value of them and hence threaten the interests of the lenders when the borrowers go bankrupt. So the environmental issues on the collateral should be an essential part of the provision.

Post-lending monitoring is another important step to ensure the security of the loans. It is a “process of regularly gathering and maintaining information relating to environmental risks during the lifetime of the transaction (Knecht, 2003, p.18)”. From the perspective of environmental risks management, the main environmental indicators should be determined based on the risk assessment work before the approval of the loans. The borrowers’ process report of good quality submitted to the lenders can be used as an instrument for monitoring (ADB, 2001, p.5). The lending staff should carry out regular site visits and present periodical reports on monitoring and evaluation of compliance with environmental requirements of the loans to the relevant committees and boards. The monitoring should cover the customers’ on-going compliance with the regulations and the conditions stipulated in the lending and borrowing contracts or agreements, the changing trend of regulations and its possible impacts, and the changes in the business activities and processes of the customers, and other issues that may have impact on the level of environmental risks (Knecht, 2003, pp.18-19). If their new risks have occurred or are likely to occur, proposals for remedies should be offered, in time.

## 6.5 Framework of ICBC's Future Policy

So what does this thesis author suggest for ICBC's Future Loan Policy? It is difficult to suggest a detailed policy for ICBC to follow, because policy is considered to be detailed and practical. In this section, based on the successful experiences of other commercial banks, some generic features are proposed that the policy-makers of the ICBC should embrace, so that environmental considerations can be incorporated into these fields.

### 6.5.1 Take Environmental Issues into Consideration in Marketing and Product and Policy Development

As discussed earlier, the industry and the banking sectors have to face the pressure from the public, the governments and NGOs to take seriously their corporate social responsibilities as corporate citizens. The business today goes far beyond the issue of profits. It is no longer the only responsibility of businesses "to use its resources and engage in activities designed to increase its profits as long as it stays within the rules of the game", as mentioned by Milton Friedman (as cited by Wheeler & Sillanpaa, 1997, p.34), business has to take the CSR and stakeholders' (instead of shareholders only) value as a new dimension of product marketing and development. So the profitability formula today has CSR as a new variable (Price & Quality & CSR), instead of only price and quality as variables in the old days (Hansson, 2003).

For example, on recognition of stakeholders' expectation for it to take its corporate social responsibility and contribute to sustainable development, Mizuho Financial Group (n.d.) has taken environmental issues into account of business activities, to take its social responsibility to contribute to sustainable development. It has successfully developed environment-related financial products and advisory services to support the customers' environmentally sound projects or programs. For project finance, it provides advisory services and arrangement of financing for Clean Development Mechanisms (CDM) and Joint Implementation (JI) investments, for wind power generation and garbage incineration facilities. For services related to global warming, it provides advisory services and surveys concerning the latest information on the Kyoto Mechanism; it provides advisory services and analyses concerning CDM/JI investments; it also involves in the preparation of Project Design Document and funding methods for carbon funds; it also supports greenhouse gas emissions trading. It even implements Life Cycle Assessment (LCA) in connection with products and services.

The Mizuho Financial Group's experience in environment-related product and service development can give ICBC some inspiration in this aspect. Due to its special position in the business life in China and its wide relationships with various stakeholders, ICBC should incorporate environmental issues into its business activities, making sure that environmental considerations are incorporated as a new dimension for their policy development, policy review as well as in their product development and their product marketing, so as to ensure that it is serious about its CSR and that it contributes to societal sustainable development by financing environmentally sound and sustainable projects. This should be integrated into both its strategic decision-making processes and into its daily business operations, just like issues such as profitability and quality. It should provide policy and procedural guidelines to direct the activities both of the top management and of the employees. The policy-makers of ICBC should be alert to the changes of public concerns and customer demand associated with environmental issues. They should take these changes as business opportunity to develop and market the right products and services to meet their demand and expectation.

## **6.5.2 Overall Policy and Specific Policies for Environmental Risk Management: EIAs and ERAs**

The environmental considerations should be integrated into the overall policies of ICBC, such as for product development and marketing policies, to direct the activities and specific policies such as EIAs policies and lending provisions, etc. Although, in China, there is no regulation on environmental issues for banks, it does not mean it is not necessary for ICBC to develop an overall environmental policy, as Barclays did. By leaping ahead without waiting for regulatory pressures to push or stimulate them to do so, they could benefit from the early adopter situation and reap the benefits, thereof. Although, the direct environmental impact of banking sector is small, “at an aggregate level the effects are not small (Lundgren, 1996, p.128).” An overall environmental policy could direct the banking staff to care about environmental issues from their daily work, rather than just on loan businesses. So, it’s a direction or trend.

For ICBC, it is better to develop specific policies first as a start to enhance its risk management system, such as EIAs and ERAs policy, which are good tools or instruments to help ICBC identify and quantify the environmental impacts and risks associated with projects.

EIAs is considered as a central instrument for mainstreaming environmental concerns at all level decision-makings (World Bank, 1996, p. 67) and the right instrument to investigate the environmental aspects, especially for large projects and projects in developing countries (Jeucken, 2001, p.140), which generally involves project screening, site selection, baseline data, environmental impacts and risk management, analysis of alternatives and environmental mitigation plans, detailing the measures to be taken during the implementation and operation of a project to eliminate or offset adverse environmental impacts, or to reduce them to acceptable levels and the actions needed to implement these measures. It aims to evaluate the potential environmental risks and impacts in the area of influence of the projects and tries to identify alternatives to manage the environmental risks. So it can be taken as the basis of ERA. In this process, natural environment, human health and safety, and social aspects are taken into account; the policy framework and legislation, the capability of the sponsors or proprietors and other variation in the projects are checked and evaluated (IFC, 1998), to identify, analyse and quantify the possible environmental risks associated, such as the probability of occurrence of the risks, their magnitude and duration, their sensitivity and irreversibility, social distribution of risks and benefits, relevance to legal mandate (Barannik, 2001,p.255). Based on the results of EIAs, the risk revealed could be graded to help determine the probability of environmental risk, as suggested by Hill (As cited by CDG, 1998, p.10). For example, the environmental risks can be graded into five grades: A, B, C, D and E, from high to low. And ICBC can stipulate in its lending provision, which are acceptable risks and which not, which should be given special attention (such as further risk assessment work, interview and site visit, and alternatives to manage the possible risks) in the project appraisal work.

To assess the environmental impacts and potential environmental risks, there are a lot tools or instruments that can be employed, such as a detailed checklist, examination of environmental reports or environmental audit reports or environmental action plans, interviews, site inspections (CDG, 1998, p.9), environmental risk handbooks and due diligence manuals that outline and interpret corporate environmental policies and procedures (Barannik, 2001, p.260). By aid of these instruments, specific and detailed information can be gathered to identify significant environmental impacts, based on which mitigation measures can be suggested (CDG, 1998, p.10). Especially the checklist, it is a practical tool. UNEP even designed a series of checklists on CP, including checklist for bankers on CP issues, which covers the information about assessment on the project itself, the market, the capability of the applicant and its management system, and its historical record, all designed to reveal the potential risks

(UNEP, 2002, pp.14-21 ). ICBC can employ these tools and instruments to serve its EIAs and ERAs work. Some commercial banks have developed advanced framework in this aspect which can give guidance for ICBC's reference when it develops its own EIAs and ERAs policies.

Take the ERA framework of Lloyds TSB as an example, it revolves around three elements: land, process and management (Coulson, 2001, p.309). For the land, the focus is on whether the site is contaminated or not and whether potential contamination exists and its possibility to cause harm to the site, the watercourses and neighbouring property. For example, is the potential borrower of polluting industrial sectors? What is the history of the land and the business? Does it have a bad record on environmental issues? Is the location where it operates next to a river or not? This can protect the bank from possible direct liability to clean contaminated land site, in case that the lender has to take possession of the land as collateral when the borrowers fail to repay the loan. For the process and management, the production processes and the management are examined to identify potential pollutants and pollution sources and to evaluate the environmental management of the potential borrowers. For example, is the process environmentally sensitive? Is the production activities properly managed? What is the emission level of CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, N<sub>2</sub>O or VOCs? Can it meet the standard or regulation on emission and waste production? Does the potential borrower have environmental management initiative (or plan)? And does it have management system to fulfil the plan? This can protect the bank from indirect and reputation risks.

The result of EIAs and ERAs will be documented and a report will be submitted to the committee or board to support their decision: whether to accept or reject the environmental risk; and it will also direct the implementation of the project and the post-lending monitoring.

In reality, an initial environmental screening is first carried out on desk studies before the EIAs and ERAs are performed. The aim of screening is to identify the potential environmental issues associated with the proposed projects and to specify the information required to assess environmental risks, liabilities, regulatory compliance adverse environmental impacts and other concerns (EBRD, 1996, p.8), based on which the necessity, breadth, depth and the type of environmental impact will be determined. For those categorized as less or no adverse environmental impact, it does not need to carry out EIAs and ERAs; it is only necessary for those with serious or significant environmental impacts. Of course, during the process of environmental screening, potential environmental benefits will also be explored, such as CP opportunity, energy efficiency, waste reduction and other forms of environmentally sound practice (EBRD, 1996, p.8), all these could be enhanced during the implementation of the projects.

Based on achievement and experience from EIAs and ERAs, ICBC can go future and develop its overall policy – a systematic environmental management system, including planning, implementation, controlling and management review including corrective actions. This system can help the bank implement the environmental policy efficiently. When the system develops to a certain stage which is comparatively complete and matured, it can be certified according to ISO 14001, which can help attest efficiency of the environmental management system as an appropriate tool for complying with environmental regulations, for achieving self-defined environmental objectives, and for maintaining continuous improvement of environmental performance, as UBS Group (UBS, 2004, p.3) did.



### 6.5.3 Public Participation and Taking Advantage of the External Mental Resources

Public participation is important for the draft and implementation of a policy. The environmental issues are related to various stakeholders, such as employees, customers, government and NGOs and are always of cross-sectoral nature (World Bank, 2001a, p.71). All interested or (potentially) effected group should be involved in the process of drafting and implementing of the policy and cross-sectoral coordination is critical. EBRD (1996, pp.18-19) stresses the consultation with the public before decision making. Barclays PLC (2002) also have all relevant stakeholders involved by consultation and publication of its policy and periodical report to stakeholders. The World Bank, in its new environmental policy and procedures, stresses the importance of public consultation at the scoping and draft preparation stages in environmental assessment (Murphy, 1999, p.8).

Another important issue is to take advantage of the external mental resources. As the commercial banks are not possible to have their own experts and specialists of all industrial sectors and the environmental issues is knowledge intensive and need certain skills and technologies, external experts and specialists or organisation have to be employed to assist in performing the EIAs and in the risk evaluations. The project proprietor's report on the relevant environmental impacts needs to be examined by the experts to make sure that the proprietor has revealed the potential environmental impacts objectively. Normally, this cannot be done by the commercial banks themselves.

For ICBC, as Mr. Yu (2004, August 10, telephone interview) mentioned, even though it has the intention to "green" the business, it's difficult to put it into reality right now, because ICBC does not have the industry and environment experts needed for this work. In this case, ICBC will need to use external mental resources in the future when it develops its policies with environmental considerations, especially the EIAs and ERAs policies, although it is crucial to have its own environmental experts and specialists for ICBC to develop and implement its policy with environmental considerations. For example, the Chinese environmental protection authorities and CP centers have a lot of experts and specialists available. ICBC should take advantage of this mental resource by cooperation with them, in its policy development, business operations and training programs. The cooperation of them can help ICBC get more information on environmentally sound projects such as CP projects at earlier stage and be the first mover in marketing.

To guide the environmental management work in financial institutions, there have been some guidelines, framework, handbook or principles developed by some international financial institutions, such as the *World Bank's Pollution and Prevention Abatement Handbook* (World Bank, 1999), the Safeguard policies, Environment & Social Project Review Procedure and the Environmental guidelines of International Finance Corporation (IFC) (IFC, n.d.), the *Environmental Procedures* of EBRD (1996), and the Equator Principles (2003). They cover environmental issues of various industrial sectors and provide guideline or framework for the assessment and management of the environmental impacts of these sectors.

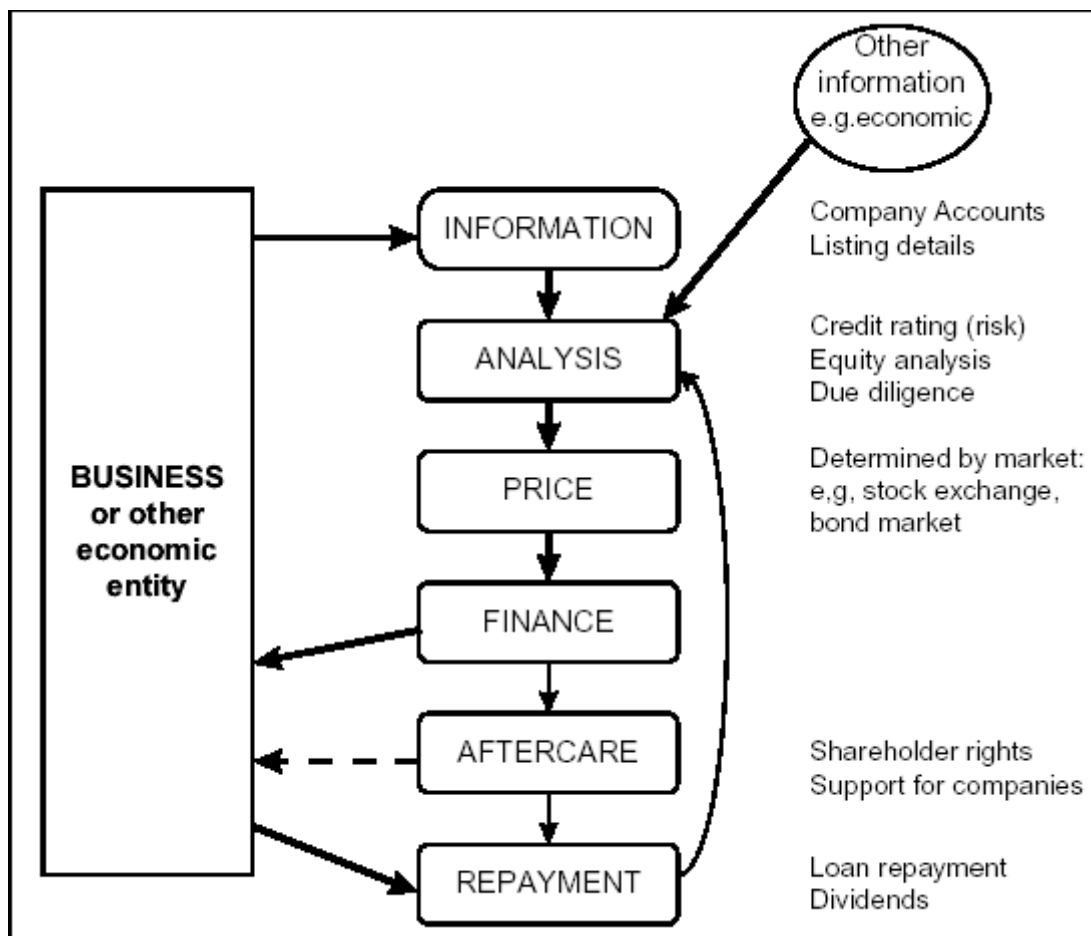
The Equator Principles (2003) is considered as a common baseline and framework for financial institutions to determine, assess and manage environmental and social risks in project financing. By adopting the principles, the adopting banks seek to ensure that the projects they finance are developed in a socially and environmentally responsible manner and reflect sound environmental practices. The principles stipulate the process and requirement of the project finance, such as environmental risk categorization, environmental assessment, law and legislation compliance, environmental management plan (EMP) and its monitoring and regular report, and World Bank and IFC's standards as minimum standards applicable, etc. the

principles hence serve as new standards for the projects to be financed. The borrowers have to comply with the environmental and social policies and processes of the lending banks to get financed.

ICBC can take these guidelines, framework, handbook or principles to serve its policy development and implementation. They will help it take the leadership role on environmental issues.

#### 6.5.4 Systematic Information Collection and Analysis

Figure 6-2 is the transaction model in financial markets. It presents that information collection and analyses that are the basis of transactions.



Source: (Delphi, 1997, p.4)

Figure 6-2 Transaction Model of Finance Markets

EIAs and ERAs, as part of the appraisal of project loans, is a process of information collection and analysis. It is essential to have information about the environmental sensitivity to do an effective job of ERAs (Jeucken, 2001, p.143). So ICBC should set up a systematic information collection and analysis system to support the implementation of its future policy.

There are a lot of information sources that can be employed by the commercial banks. such as environmental reporting of the companies, standardized list of questions ( the above mentioned checklist), information from specialized agencies, computer models for

environmental risk classification, standardized EMSs like ISO 14001, permit, policy documents and other governmental sources, newspapers and specialized magazines, the past experiences of other banks and their environmental clauses in the contract, etc. (Jeucken, 2001, p.145). The challenge is how to combine information gathered with experiences and concept of the future to have a right assessment of the potential environmental impacts and risks associated with the projects, by aid of certain methods such as scenario analysis, expert consultation and systematic contact with the government, etc.

For this purpose, ICBC should develop its supporting tools, such as checklist forms, environmental screening checklists, site visit environmental checklists, sub-sectoral environmental guidelines, etc. World Bank, EBRD, UNEP and ADB have done a lot in this aspect. Their guidelines and handbooks such as *World Bank Pollution Control and Abatement Guidelines* and *World Bank EA Sourcebook* can all be used to support the ICBC's EIAs and ERAs work, as Bank of America, Deutsche Bank and UBS did (Barannik, 2001, p.260).

To help gather information, ICBC can require the project sponsors or proprietors to prepare a report on EIAs, as International Finance Corporation did for its Category A projects (IFC, 1998), because they are the expert of their own industrial sector and have sufficient knowledge and skills for the job. Besides the report of EIAs, Mizuho Financial Group (n.d.), as an adopting bank of Equator Principles, even requires the borrowers to develop an environmental management plan for projects that may have seriously negative social and environmental impacts and supervise their compliance with the plan. The regulations in China has set the basis for this, for example, the Environmental Impact Assessment Law of PRC requires all projects with environmental impacts should assess their environmental impacts associated (EIALPRC, 2002). This should be stipulated clearly in ICBC's lending provisions and included in the contract or agreement clause, to direct the lending staff of ICBC and have the project sponsors or proprietors committed. But the reports prepared by the enterprises are generally problematic. They may underestimate some environmental impacts to meet the requirements of the banks to get financed. So ICBC should examine the report and assess the associated environmental issues independently, and when necessary it can engage external experts or organizations for consultation.

### **6.5.5 Differentiated Policy to Projects and Customers with Different Environmental Performance**

The purpose of taking environmental consideration into business operation is to enhance the safeguard system of commercial banks by identifying and managing environmental risks and exploring the business opportunities created by the environmental issues. But this action will stimulate certain developments in society towards sustainable development (Bouma, et al, 2001, p.35). If ICBC has differentiated policies for companies or projects with different environmental performance, it will accelerate this process.

For example, ICBC can, consistent to the national industry policy, set different requirements in its loan provision for projects in different industrial sectors and for customers with different environmental performance. They can do this by allocating credit lines, by varying the price (interest rate), by differential customer rating on the non-debt capital fund threshold, etc. For projects or customers deemed to be environmentally sound and sustainable, ICBC can allocate a larger credit line and offer favourable interest rates, requiring lower initial non-debt capital funds and provide loans without collateral or pledge and vice versa.

For the polluting sectors, if the project is of poor environmental performance and there is no possibility to improve or the proprietor is reluctant to do so, ICBC should reject this kind of loan application outright; for those with potential for improvement from an environmental point of view, in the contract or agreement, there should be included clauses requiring the project sponsor or proprietors to meet some environmental standards or requirements, such as by additional investment in waste treatment facilities or introduction of CP technology, etc., only when these requirements have been satisfied, can the transaction be effected, as discussed earlier; and ICBC should observe the right to adjust the interest rates or maturity of the loan (Jeucken, 2001, p.119) and require financial security (Jeucken, 2001, p.134), when potential environmental risks materialize.

The ‘Contractual Indemnification Provision,’ can also be applied to projects in polluting industrial sectors, to protect ICBC from third party claims and or other specific liabilities due to the environmental problems it financed (Barannik, 2001, p.258). This kind of clause in the contract or agreement can help to allocate responsibility for environmental problems and the risks of related costs, and protect against expensive surprises.

### **6.5.6 Training Programs**

As Mr. Yu (2004, August 10, telephone interview) mentioned ICBC does not have industry and environment experts or specialists. This has hindered ICBC to realize the idea of “greening” its business, even though they have this idea and intention in mind. So it is critical for ICBC to plan and design a series of training programs to ensure the implementation of its future policy with environmental considerations.

This training program should start from the concept sustainable development, and the impact of environmental issues and its linkage to environmental risks to banking business to ensure ICBC’s staff having this concept and consciousness of this issue in mind to influence their future behaviour. ICBC should also look seriously as CSR as another important topic for them to engage in and to develop policies to support their activities in CSR within the company and through their loan operations. But the most critical issue is to arm ICBC’s lending staff with adequate knowledge, skills and capacities to carry out EIAs and ERAs. . It would be better if ICBC has its own experts and specialists, by anyway external mental resources should be utilised to ensure the reality of the policy. For this purpose, some technical support and guidelines like the earlier mentioned *World Bank’s Pollution and Prevention Abatement Handbook* and Sub-sectoral guideline, IFC’s safeguard policy and procedure, and UNEP’s training program on CP are all resource kits; some international banks such as Bank of America, Barclays PLC and EBRD all have comparatively matured policy and procedures, their experts and experience can be employed to help ICBC in its policy.

Greening their accounting is also a good tool for commercial banks to evaluate their customers, ICBC can take this subject into its training courses to aid the EIAs work.

### **6.5.7 Use it as a Communication Tool**

ICBC has done a lot trying show its responsibility to the society, but is only stops at some public activities such as donations, compared to which, incorporating environmental consideration into business operation is a systematic and powerful communication tool, because by taking environmental considerations into business operation, ICBC can show the stakeholders how it is responsible for sustainable development, how it has contributed to the society, as a corporate citizen of the community or society, which will meet the expectation of them. ICBC should take “Greening” business as the highest level of CSR, instead of some donation activities as it has done in the past, and regard the environmental issues as important

as economic and social factors. Environmental consideration should be one of the three dimensions of its policy development and decision-making: economic, social and environmental, which match with the three pillars of sustainable development. This should be incorporated into the periodical reports publicized such as annual report and have this report and its policy statement available for the public. This communication can help ICBC get understanding and support from stakeholders, and hence gain more competitive advantage by better public image.

It should also be used as a good tool to influence its customers. To get financial support by ICBC, the companies have to meet certain environmental performance standards embraced in its lending policy; to get financed in a project, the companies always communicate with the commercial banks for their intention to support, ICBC can take this opportunity to advise them adopting and investing in CP technologies or other environmental sound ones, supported by its differentiated favourable policy to different projects with different environmental performance. For those can not meet the environmental and social standards set by ICBC, ICBC can engage the borrowers in their efforts to seek solutions to help them back into the compliance, by aid of communication and advisory services, as Mizuho Financial Group (n.d.) did.

EIAs are considered to be a “proactive” tool, as mentioned earlier. During this process, the nature, magnitude, significance of the potential environmental impacts can be identified; and as mentioned earlier, during the process of environmental screening, potential environmental benefits will also be explored, such as CP opportunity and energy efficiency. This information should be exchanged systematically and transparently among the interested parties (Barannik, 2001, pp.259-260). This communication can help the project proprietors design better projects and to improve their performance (World Bank, 1996, p.67). The improved environmental performance can reduce the corporate risks and can improve s the bank’s credibility (World Bank, 2001a, p.71).

### **6.5.8 Top Management Awareness and Support and Effective Governance with Definite Responsibilities**

As mentioned above, environmental considerations should be a new dimension in their corporate business policy, strategy, procedures and products. The awareness of environmental issues of ICBC’s top management’s is really crucial, both from the aspect of risk management and business marketing. They should take the leading role in the formation of the policy with environmental issues incorporated and offer substantial support. This should be accepted and supported by the top management.

The top management of ICBC should proactively have the environmental considerations written into its charter or constitution, as EBRD did in its founding agreement. This can have both the top management and its staff committed to environmentally sound behaviours in their business operations and products and policy development. To contribute to the national and international society, the top management of ICBC should endorse the UNEP *Statement by Financial Institutions on the environment and sustainable development*, the Equator Principles, China Agenda 21. This can also have ICBC committed to the commitments and principles embraced by these initiatives and help it get access to these network resources.

The top management of ICBC should set principles and objectives to direct its future policy and business operations. These principles and objectives should ensure ICBC can identify and manage the environmental risks and explore the environmentally sound business opportunities. To develop and implement the policy, the top management of ICBC should

empower a governance structure to take their responsibilities seriously to incorporate environmental issues into their business operations, and to formulate written policies to direct the business operations. Responsibilities should be assigned to different units to ensure the policy developed and implemented in the future business operations, policy and product development.

Some banks in the world like EBRD, Barclays PLC, Citigroup and UBS Group have established comparatively advanced governance structure in the environmental management system. The environmental organizational structure of EBRD (1996, pp. 2-3) is somewhat complex, it has seven roles with different responsibilities for the implementation of its environmental policy, including Project Sponsor, Operational Leader, Environmental Appraisal Unit, Office of the General Counsel, Operation Administration Unit, Project Evaluation Vice Presidency and Environmental advisory Council.

Barclays PLC is one of the pioneers in this aspect. It has established a matured environmental governance structure. The responsibilities were assigned to different actors: the policy sponsor, policy owner, consultative body and specific function unit. The Group Chief Administrative Officer is the policy sponsor, who is empowered by the top management – the Group Chief Executive to sanction the subordinate policies and procedures; the Group Environmental Management is the owner of the policy, responsible for ensuring the environmental policies are developed and implemented, through an Environmental Director; the Environmental Steering Group is the consultative body to the policy sponsor, comprising the senior representatives from major business areas and functions, who are responsible for overseeing implementations of and ensuring an effective structure in place for delivering compliance with the policy within their own business areas; Environmental Risk Management Unit is the specific function Unit, responsible for incorporating environmental considerations into the lending process (Barclays, 2002).

Their successful experience of EBRD and Barclays PLC in environment organizational governance can serve as template for ICBC's organizational structure related to environmental issues. ICBC's environmental organizational structure should include the following roles with definite responsibilities to have environmental considerations incorporated into the development, implementation and monitoring of its future policies.

Top Management:

The top management has the responsibility to offer proposal to write the environmental considerations and sustainable development into its charter or constitution to have themselves and its staff committed to the mandate. They are responsible for empowering the sponsor to initiate the policy and approve the policy. It should provide financial and human support in the policy development and implementation. It is also responsible to approve the sanction of the staff with insufficient implementation of the policy, according to the proposal of the Auditing Unit. The top management of ICBC should actively take part in the regional and global initiatives for sustainable development, such as the earlier mentioned *UNEP Statement by Financial Institutions on Sustainable Development*, the Equator Principals and Agenda 21, to take advantage of the networks resources. To employ the successful experience of other banks, ICBC should build cooperation and partnership with them. The top management is responsible for the development of this kind of cooperation and partnership.

Sponsor:

It can be made of representatives from different function units and its responsibility is to draft the policy and report it to the top management for approval. It should oversee the implementation of the policy and responsible for further update and development of the policy. It should be responsible for the briefing or reporting the environmental policy, initiatives and other issues related to environment. It should develop EIAs and ERAs tools to support the operational staff to implement the policy. It is also its responsibility to manage stakeholder relationships associated with environmental issues. It is responsible for the training kits in the training program. It is the sponsor's responsibility to plan and carry out the regional and global initiatives for sustainable development endorsed by the top management, and to carry out the cooperation with other banks developed by the top management.

### Operational unit:

The Operational Unit is the complimentary unit of the policy who is responsible to ensure the implementation of the policy. It is responsible to review and identify the environmental impact associated with the projects and prepare the environmental review memorandum. It is responsible to assess the environmental impacts and risks related to the projects based on the information collected and the result of information analysis, by aid of EIAs and ERAs tools. It is responsible to incorporate the environmental issues into lending agreement to have the borrowers committed to environmentally sound performance. Public consultation is also the responsibility of this unit. It should report the result of the environment review and the result of EIAs and ERAs to the decision-makers of the project loan business to support their decision. It should also report the operation status to the Sponsor periodically and offer its proposals for further development of the policy. It is its responsibility to monitor the environmental issues addressed in EIAs and ERAs and the compliance of the environmental management plan required for the projects with potential serious environmental and social impact.

### Counsel

It is responsible to advise the legal aspects of regulatory compliance and local and international environmental laws and agreements. It is its responsibility to agree with the Operational Unit in legal documentation such as the earlier mentioned environmental commitment clauses or 'Contractual Indemnification Provision'.

### Audit unit

Its responsibility is to monitor the implementation of the policy within the bank. If insufficient implementation is discovered, it should report to the top management with its proposal of sanctions.

### Consultative Body

It may involve senior managers from different business areas. It may be involved in the consultation of the drafting and initial review of the policy. The views of the members will be deal seriously for the development of the policy to ensure its feasibility and the interests of all effected parties taken into account.

During the whole process of policy development and implementation, coordination among the above mentioned roles are important. And there should be more units involved, for example human resource unit may be involved in employment of specialist and training program; logistic units may also be involved for logistic support. But they are not the focuses

of this thesis and will not be addressed here. They should cooperate with and assist each other to ensure the implementation and further development of the policies.



## 7 Conclusions and Recommendations

### 7.1 Conclusions

So it can be concluded that under the background calling for sustainable development, sustainable development itself and stakeholders' expectation of CSR of organizations have been the two external driving forces for them to "Green" their business. Organizations are making efforts to take their social responsibilities to meet the expectations from stakeholders to "green" their business, by integrating environmental consideration into policy-making, business operation and wherever it is possible. The special position of commercial banks and the far-reaching influence of their loan business have been recognized by the public, governments, NGOs and the banking sector itself. They are expected to take their responsibility to "green" their business and some of them have been the front-runners in this work by integrating environmental considerations into their business operations and policy development.

ICBC, as the largest commercial banks in China, has close relationship with the industry of China and is changing towards a modern commercial bank. It has also made some achievement in its internationalization process.

The study of its project loan business, in response to the first research question, presents that it has a large share in its total loan business and has far-reaching influence on the industry and national economy as it supplies the capital fund for projects of different natures. The further study of its project loan appraisal policy reveals that ICBC started to consider environmental issues in 2003 in their project loan appraisal, but there is still no environmental consideration incorporated into this policy and its business operation. Due to lacking of knowledge and skills to support the lending staff, its parameters on environmental issues are simple and the outline is rough, and the main concern is to ensure that the project proprietors have received the official authentication. And due to the fact that ICBC lacks industry and environmental experts, their intention to "green" their finance business cannot be realized right now.

This does not match with the social responsibility it should take as a large corporate citizen and is not in line with the vision of sustainable development. ICBC will lose competitiveness if it is lagging behind in CSR and "greening" business in the process of internationalization and transition to a modern commercial bank. And due to lacking of proactive policy with environmental considerations incorporated, ICBC has to face potential risks originated from environmental issues and loss of business opportunities generated from environmental concerns.

The analysis, in respond to the second research question, shows that the environmental risks for commercial banks came from the environmental issues related to their customers – the industry. Lacking of consciousness of negative impact of human activities led to a lot of environmental issues we are facing today, such as water pollution, air commission, solid waste and hazardous waste, soil and groundwater contamination, and human health. These environmental issues can be converted to environmental risks, due to the legal requirements and public concerns. To meet the legal requirement, the companies have to invest additionally in pollution abatement equipment or technology, or take measure to treat the waste they discharge; insufficient ability to meet legal requirement will have the companies exposed to risk of being fined or being shut-down, or they are required to take the responsibility to clean up the contaminated soil. Public concerns may lead to and accelerate the legislation on environmental issues; it may also change the public's perception of and value on

environmental issues and hence influence the attitude and behaviours of the investors, suppliers and consumers. This will change the market situation and influence the business in material supply, market share or corporate image or reputation. Insufficient management may lead to accidents, which will cause water and air pollution, soil contamination, threat to human health and loss of life, especially in the polluting sectors.

When environmental risks are materialized, they emerge in the form of economic risks to the companies. The commercial banks will be exposed to risks converted from their customers. The insufficient material supply, reputation loss, the additional investment, the cost of fine or clean-up, the declining of sale and market share will diminish the customers' cash flows and hence reduce their repayment capacity. The changed environmental requirement or standard may lead to the value decrease of the equipment as collaterals; the value of land as collateral will also decrease greatly due to contamination or the commercial banks may be required to take the responsibility of clean up if the borrowers bankrupt. Sometimes the commercial banks may suffer from reputation loss due to the negative environmental impacts of some of the projects they have financed.

The study on environmental issues in China shows that environmental situation is considered serious despite of the efforts from the authority and achievement that has been made. But the Chinese government has recognized the seriousness of the problem and has integrated environmental protection into various policy and legislations. Sustainable development and ecological environment improvement has been one of the main targets for social and economic development and has been an integrated part of the five-year plans of the national economic and social development. In the coming years, the legislation and its enforcement will be enhanced. Market mechanism and economic instruments will be employed to abate the adverse environmental impacts, such as "green tax" and EPR. The standards will be higher and the regulations will become more stringent. There will be more concerns on environmental issues and more demand for high quality environment. All these mean more environmental risks for the industry in China. They have to invest to meet the higher standards and requirement. Higher charges and extended responsibility to take back their products at the end of their life will increase the cost of their products and reduce their competitiveness. This is challenge both to the companies and commercial banks in China.

But due to lacking of policy with environmental considerations incorporated and lacking of knowledge and tools, ICBC's project loan appraisal staffs can not fully reveal the potential risks in their appraisal work, by aid of literature review, qualitative analysis, simple parameters and rough outline. ICBC's current policy is static to the future changes. The project loan appraisal staffs cannot forecast the trend of the future change of environmental policies and its potential influence on its customers and hence on ICBC itself. And without the direction of a policy with environmental considerations, ICBC's working staffs are not aware of the relationship between the environmental issues and the potential risks. This will have ICBC exposed to the potential risks.

Analysis also illustrates that by taking environmental issues into business consideration, commercial banks can also benefit a lot from the aspect of risk management and business opportunities created by environmental issues.

Environmental consideration in business operations and policies can help the commercial banks set up earlier warning mechanism and develop proactive tools such as EIAs policy and hence enhance the risk management system. By aid of these tools, the environmental impacts and the relevant potential risks can be identified at earlier stage in the loan appraisal work.

Commercial banks can communicate this to the customer and take measures to minimize the potential risks from the starting point and hence reduce the possibility to materialize.

The environmental issues provide a good platform for commercial banks' business. The environment protection business has developed to a new business sector. This is the new income resource of commercial banks. To meet the environmental requirements and legislation, the companies have to invest a large amount in environmentally sustainable technologies and projects such as CP. This means large market opportunities for commercial banks. International financial institutions' business provides opportunities for commercial banks to act as intermediary. And CP can be one of the dimensions of the commercial banks' advisory service to create more business opportunities, which can create more business opportunity for commercial banks and help the customer grow in profitability and competitiveness. The reduced environmental impacts, risks and potential liability also reduce the environmental risks in the business portfolios of commercial banks.

But due to lacking of awareness of the economic and environmental benefits of CP, ICBC missed the business opportunity to market its business. Without a policy with environmental consideration incorporated, ICBC's staffs has no sufficient knowledge to advise its customers investing in CP and is losing the opportunity to be the first mover in creating market business by advisory service and helping customers in capacity building for future growth, which will help improve customer relationship and loyalty and cultivate future market.

So enhancing the risk management system and exploring business opportunities have been the two internal driving forces for ICBC to take environmental consideration into policy making and product development and marketing. Analysis shows that, in response to the third research question, there are some opportunities for commercial banks like ICBC to incorporate environmental considerations into their business operation and policy development, such as lending provision, risks assessment and management, environmental contract clause and post-lending monitoring. Lending provision is considered the most influential one both to the potential borrowers and the working staff of commercial banks. By stipulating the environmental standards that a project should meet and differentiated policy for customers and project with different environmental performances, commercial banks can screen out projects and potential borrowers that are not environmentally friendly or not sustainable. By aid of EIAs and ERAs, the potential risks can be identified and quantified. The result of EIAs and ERAs can support the decision making of approval or rejection of the loan application and facilitate the selection of collateral and post-lending monitoring.

The top management of ICBC should be aware of the expectations towards sustainable development from various stakeholders and the social responsibility ICBC should take as a large corporate citizen to contribute to realizing the vision of sustainable development. They should aware of the threats they are facing and to face in the future due to lacking of policy with environmental considerations incorporated.

To manage the potential environmental risks and enhance its safeguard system, and to take the business opportunities created by environmental issues, ICBC is in urgent need to develop a new policy with environmental considerations incorporated to direct the activities of its working staff. The policy should integrate environmental considerations into the following areas: environmental risk management and business marketing; overall policy and specific policies for environmental risk management like EIAs and ERAs; public participation in the policy on environmental issues and taking sufficient advantage of the external mental resources on environment; systematic information collection and analysis; different policies on projects and customers with different environmental performance; and supportive training

program. This policy should be used as an effective communication tool to different stakeholders and use it to influence its customers towards environmentally sound practice. This policy should be sponsored and supported by the top management of ICBC based on their consciousness and awareness of environmental issues on risk management and business opportunities. Effective governance with definite responsibility should be set up to implement it.

Some proactive international banks has developed advanced environmental policies and integrated this into their business operations and policy development. They have accumulated abundant successful experiences in different aspects.

When the stakeholders raised concerns on environmental issues and expected them to take their responsibilities to reduce the adverse environmental impacts related to their business, their top management recognised the pressure from them and successfully developed environmental policy and adopted it as a competitive strategy to “green” their business, such as Barclays PLC and Bank of America. They have developed EIAs policies as proactive tools for risk identification and quantification to enhance their risk management system and to support their decision making. Mizuho Financial Group has successfully developed environment related financial products and advisory services to help realize environmentally sound business.

Some banks even take environmentally sound business and sustainable development as mandate. South Shore Bank has made “greening” business as a commitment and integrated environmental considerations into its business development and building “green” market. EPRD has environmentally sound business and sustainable development proactively written in its founding agreement as a mandate and highly prioritized in its business operation. Environmental soundness and sustainable development have been integrated into its environmental appraisal process and nine related areas. To implement their environmental policies, EBRD and Barclays PLC have established advanced environmental governance structure, and definite responsibilities have been allocated to different roles.

ICBC can employ these experiences of these environmentally proactive banks to develop its future policies with environmental considerations incorporated. Their adoption of environmental strategy can give inspiration to the top management of ICBC and help them change their mind-set on how to take environmental considerations as competitive strategy, instead of taking it as an obstacle or burden, and hence seek to take the leading role on environmental issues nationally or internationally. Their experience in environmental risk management and environment related product and service development can give ICBC some inspiration in its future work. Their governance structure and responsibilities can serve as a template for ICBC’s future environmental governance structure.

These proactive banks also have developed advance tools or instruments to implement their environmental policies, such as Barclays PLC’s EIAs policy and Lloyds TSB’s ERAs framework, ADB’s categorization of the projects according to their potential environmental impacts, UNEP’s checklists for CP, Equator Principles and the environmental guideline, handbooks and procedures developed by World Bank, IFC, ADB, EPRD and UNEP. All these are good resources available to help ICBC develop and implement its future policy with environmental considerations.

ICBC should take efficient advantage of these successful experiences and resources to serve its future policy development with environmental considerations incorporated and its implementation. The integration of environmental considerations into business operation and

policy development will help ICBC take the leadership position in environmental issues and hence sharpen its competitive edge. It will benefit from risk management enhancement and business opportunities generated from environmental issues. It will also benefit from the better public image due to its “green” business and its contribution to sustainable development as a corporate citizen.

## 7.2 Recommendations

### 7.2.1 ICBC’s policy should be tailored to China specific situations in China

The legislation, society and cultures in China are quite different from those of other countries. So for the ICBC, when it develops its own environmental policy, such as for EIAs and ERAs, the experience of other commercial banks can be employed to help it, but it has to take into consideration these factors and others specific to China. The following facets should be considered:

- a) The public awareness of environmental issues and the market;
- b) The availability of mental resources to provide the bank with experienced, external support;
- c) social credit system and the creditability of information; and
- d) Its own characters and capability to develop its own policy, which is adaptable to the policy and market situations.

### 7.2.2 Barriers to Overcome

ICBC should find a good timing or opportunity to introduce its new policy with environmental considerations. But EIAs and ERAs policy should be developed as early as possible, because they are good tools to help identify and manage environmental risks. But there should be some barriers for ICBC to introduce its policy with environmental considerations incorporated.

The first barrier is the lack of environmental experts and specialists. Even though training program and employing external has been proposed by the thesis author, ICBC could not solve the problem in short time. It should employ specialist staff in various fields, such as environmental engineering, environmental management and policy, information analysis, natural and social science, lawyer, etc.

The second barrier is financial and human cost. The planning, drafting, implementing, updating and monitoring of policy on environmental issues all entail additional financial and human input.

For this reason, EIAs and ERAs should be carried out on cost efficient bases from the aspect of financial and human input. Not all project loans need EIAs or ERAs. Besides those categorized as less or no environmental impacts, those of small amount just need initial EIAs for the lending staff to review. In addition, efficient EIAs and ERAs procedure should be developed to support the loan appraisal staffs. Modern technologies should be employed. Such as computer model of EIAs and ERAs can be developed to support the staffs in their daily loan appraisal work to support the implementation of the policy. It can help them improve the working efficiency.

Sustainable development requires universal and shared responsibilities among organizations and individuals. It is important for ICBC to coordinate with other organizations such as environmental authorities or education and research institutions, financial institutions even its competitors, namely other commercial banks in China. The banking associations in China can do a lot to promote this kind of coordination and provide a platform for open dialogue and exchange of information and knowledge. This kind of cooperation and transparency can help ICBC take advantage of network resources that can be shared. Shared resources are always economic in financial and human input self developed ones.

The future policy of ICBC should be featured as proactive to face the challenges from the rapidly changing situations in China and abroad, especially in environmental policies. ICBC's future policy should aim at the international environmental standards and take both the national and international standards into consideration when it develops and implements its future policies. The higher standards can prevent ICBC from frequent update of its policies to keep up with the rapidly changing situations in China.

Besides, constant, transparent and open dialogue with interested and potentially effected stakeholders can help ICBC efficiently address the key issues related to the projects and reach the right alternatives or solutions for them.

The third barrier is the balance between profitability and environmental considerations.

Some industrial sectors or companies are featured as polluting, but some of them are considered economically profitable. This is attractive to commercial banks in profitability and they are reluctant to withdraw from supporting these sectors or companies. With the consciousness and awareness of environmental issues and sustainable development, the shareholders of commercial banks should expand their expectation from profit maximization or value increase to include social and environmental sustainability. The embedding this vision in the founding agreement or institutional constitution can help in solving this problem, as earlier suggested.

The forth barrier is lack of legal requirements for banks on environmental issues and for companies to release their environment related information.

In China, there is no regulation on environmental issues for banks. And by leaping ahead without waiting for regulatory pressures to push or stimulate it to do so, ICBC could benefit from the early adopter situation and reap the benefits thereof, as mentioned earlier in section 6.5.2. But its competitors who have not adopted environmental policies will continually finance the non-environmentally and socially sound companies and projects. This will undermine the foundation of sustainable development. Another problem is that there is no other legal requirement for companies to disclose the information on environmental impacts and environmental risks than the earlier mentioned Environmental Impact Assessment Law of PRC mentioned in section 6.5.4. This will be a hindrance for ICBC to collect information required in the process of EIAs and ERAs. To solve these two problems, ICBC should use its power, together with other environmentally proactive banks in China and the banking associations, to lobby the Chinese authorities to set relevant legal requirements for banking sector on environmental issues and for companies on further environmental information disclosure.



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## Abbreviations

ABC	Agriculture Bank of China
ADB	Asian Development Bank
AM	Agriculture Ministry
BOC	Bank of China
BOCS	Bank of Communications
CBRC	China Banking Regulatory Commission
CCB	China Construction Bank
CDM	Clean Development Mechanisms
CFCs	Chlorofluorocarbons
CNCPC	China National Cleaner Production Centre
CP	Cleaner Production
CSR	Corporate Social Responsibilities
EBRD	European Bank for Reconstruction and Development
EC	European Communities
ECI	Earth Charter Initiative
EEA	European Environment Agency
EEE	Electrical and Electronic Equipment
EIA	Energy Information Administration of the U.S
EIAs	Environmental Impact Assessments
EIC	Environmental Information Center of SEPA
EMP	Environmental Management Plan
EMS	Environmental Management System
EOP	End of Pipe
EPA	Environmental Protection Agency
EPR	Extended Producers Responsibility
ERAs	Environmental Risk Assessments
GMOs	Genetically Modified Organisms
ICBC	Industrial and Commercial Bank of China
IFC	International Finance Corporation
IIED	International Institute for Environment and Development
IPP	Integrated Product Policy
JI	Joint Implementation
LCA	Life Cycle Assessment
NCCPPCC	National Committee of the Chinese People's Political Consultative Conference
NGOs	Non-governmental Organizations
NPCPRC	National People's Congress of the People's Republic of China

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ODCs	Ozone-depletion compounds
PBC	People's Bank of China
PCBC	People's Construction Bank of China
RoHS	Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment
SC	State Council of the People's Republic of China
SEPB	State Environmental Protection Bureau of China
SETC	State Economic and Trade Commission
UBS	Union Bank of Switzerland
UNEP	United Nations Environmental Program
UNGC	the Global Compact of United Nations
VOCs	Volatile Organic Compounds
WBCSD	World Business Council for Sustainable Development
WCED	World Commission on Environment and Development
WEEE	Waste Electrical and Electronic Equipment

## Appendix-1 Interview with an analyst of ICBC on the pulp and paper industry

Interviewee: Mr Zeng X., analyst of ICBC on pulp and paper industry

Aim: To understand ICBC's business in a certain industrial sector

Time: June 14, 2004

Tel: 86 10 83557098

Questions:

1 How many customers does ICBC have in this sector?

By the end of September 2003, according to the official statistic data of China, there were 2716 pulp and paper mills in China, and ICBC has loan business relationships with 1350 of them at the end of the year, of which about 100 are pulp mills and others are integrated ones, with pulping, bleaching and paper manufacturing.

2 What is the outstanding balance of loan in this sector by the end of 2003?

It's commercially confidential.

3 How did the closing-up of small paper mills influence ICBC's security of assets?

There should be, but we don't have data on it.

## Appendix-2 Interview on Director of project loan appraisal department of ICBC

Interviewee: Mr Yu C., Director of project loan appraisal department of ICBC,

Aim: To understand operation of ICBC's project loan appraisal

Time: Aug. 10, 2004

Tel: 86 10 66106758

Questions:

1 How to assess the impact of the environmental policies to the project itself and that to ICBC in the project loan appraisal?

ICBC focuses on the impact of policy environment and business operation environment of the business to see how these influence the project proprietors in finance, such as the national and local industrial policy; fiscal and tax policy; financial policy; the character of the enterprise such as whether it is supportive or forbidden or to be maintained according to the industry policy, how its relevant industry will influence it along the supply chain or value chain; what is the market share and place of its product, is it a monopoly or not (monopoly is the most fragile one in the transition economy), etc.

For the environmental protection policy, ICBC did not take it into consideration until last year (2003). The parameters are somewhat simple and the outline is rough (not detailed). If the project proprietor has sufficient environmental impact analysis in its feasibility report, we can say this project is worthy to be considered; if not or it has bad record on environmental issues in the history, this project will be denied.

We also consider environmental protection cost of a project. If it's too high, it will not be financed.

2 How is the chapter of environmental impact in the project proprietor's feasibility report utilized for ICBC's project loan appraisal?

Some local branches of ICBC excerpt (or copy and paste) the content of the feasibility report, which lowers the threshold of the projects.

3 When assessing the technical conditions of one project, from which aspects is it assessed?

Are environmental issues involved here?

We do that mainly from the financial aspect of the technology. ICBC does not have environmental experts to do so and does not utilize external experts and specialists.

4 When assessing the production conditions, do the appraisal staffs consider the influence of environmental policy on supply of raw material and energy, cost and trade terms?

We have initial consideration of this issues but its not enough and not intensive. And some branches excerpt the relevant content of the feasibility report.

5 How are projects of polluting industrial sectors treated in ICBC's project loan business?

In 2001 and 2002, the Chinese authorities launched industry policies in which some polluting industrial sectors are listed as "limited or forbidden to develop", such as electrolytic aluminium, pesticide, pulp and paper, etc.; and the central bank – People's Bank of China asked the commercial bank not to finance the projects of these industries or diminish the loans in these industries.

But for the existing customers among the limited or forbidden list, commercial banks have difficulty in business operations to withdraw loans from them. For example, there is a monosodium glutamate production enterprise in Henan province. It has very good financial performance and contributes a lot to the commercial banks. But the pollution of is really serious and even affects the neighbouring provinces. Due to competition factors and driven by profitability and fearing loan lost, commercial banks there are reluctant to withdraw loans from it.

So what we do better is to take these issues into consideration when financing new projects and new customers. First, we will check whether the project proprietor has got the authentication from the environmental protection authorities. If it does have, then we can start the appraisal of it. But it's really difficult for us to take environmental issues into detailed consideration, because there is no industry or environmental expert or specialist in commercial banks in China.

Driven by the profitability, some local branches sometimes are very active to present some application of project loans to the head office for approval. For example, one provincial branch once presented a more than 500 million RMB (equal to 60 million U.S. dollars) project loan proposal to the head office. The applicant was a local chemical enterprise that planned to build a factory by purchasing second-hand facilities from another province. Considering the feasibility of operation of second-hand facilities and the potential serious pollution, which exceeded the acceptable standards then, the head office denied that application. Another provincial branch once presented an application of a large size electrolytic aluminium project, which was also denied due the national industry policy and due to its potential for high-energy consumption.

We have working staff gathering information about these polluting industrial sectors and are monitoring the changes of relevant standards and regulations, even in some areas such as Chongqing city and Henan Province, which are in the upstream area of Yangtse River and Huanghe River and have bad records due to pollution accidents in the past. Based on the information gathered, we have those with bad records on environmental issues listed in a blacklist and have no considerations on the finance of them in the future.

And I'm thinking about how to contribute to "green economy", even if the project proprietor has got the official authentication, the working staff of ICBC will independently assess the condition of water and waste treatment and air emission of the project. If the project is not environmentally sound, it will not be financed. But it's only an idea or intention, because we don't have the expert and specialist needed now.

7 Does ICBC have cooperation with Chinese CP authorities?

No. The head office is responsible for management and supervision, instead of marketing. Maybe some branches such as Beijing City Branch do, but I am not sure.

### Appendix-3 Interview with the Financial Manager of the Shandong Binzhou Huanghe Paper Group Co. Ltd

Interviewee: Mr Zhou Yongge

Aim: To understand how environmental policy changes influence the enterprises in additional investment and cost.

Time: Aug. 10, 2004

Tel: 86 13506376598

Questions:

How have the environmental policy changes influenced your company?

For these years, the Chinese authorities, including local ones, have updated the environmental protection requirement for times. The standards are becoming higher and the legislations are becoming stringent. For example, the authorities ask the local government close up the pulp factories that don't have appropriate waste treatment facilities.

To meet the updated requirement, since 1997, our company has invested more than 110 million RMB (13 million U.S. dollars) in a waste treatment system, an alkaline recycling system and a water recycling system. The company itself does not have sufficient cash flow for such a large investment. . The companies had once met the problem of funds supply from 1997 till 2003, but now we have solved this problem: we raised the capital needed by various means, such as supply from the cash flow in the operation, joint venture, raised money from the employees, and a little part from the bank loan, etc.

The pulp and paper enterprises in China are integrated ones. For those, which cannot deal with problem of the investment in waste treatment systems, such as a company in Gaoqing County, they have to close their pulp facilities and buy pulp from the market; but the costs for purchasing the pulp are higher.

## Appendix-4 Interview with the Director of the Shandong Bohai Oils and Fats Industrial Ltd

Interviewee: Mr Pei L.

Aim: To understand how environmental policy changes influence the enterprises in raw material supply.

Time: Aug. 9, 2004

Tel: 86 1313854386668

Questions: How did the Regulations on Management of Biosafety of Agro-GMO Biology influence the raw material supply in your industrial sector?

In 2001, the Chinese authorities launched Regulations on Management of Biosafety of Agro-GMO Biology and accordingly the Agriculture Ministry set out some relevant ordinances to ensure the implement of it, such as Ordinance on Management of Assessment of Biosafety of Agro-GMO Biology, Ordinance on Management of Import and Export of Biosafety of Agro-GMO Biology, Ordinance on Management of Labelling of Biosafety of Agro-GMO Biology, etc. This had influenced the material supply for a period of time, especially in the first months when it was launched. No company could get the certificate to import soybeans from America and Brazil, but the problem is that the domestic supply could not meet the demand of the oil processing enterprises. The large companies have larger stock capability and could stock for the future use in the coming months; for the medium and small companies, they had to stop due to lacking of soybean supply.



## Appendix-5 Interview on vice Manager of Credit Department of ICBC, Binzhou Branch

Interviewee: Mr Geng Q.

Aim: To understand operational facts in the project loan appraisal, with focus on international market related issues

Time: Aug. 25, 2004

Tel: 86 543 3222052

Questions:

1 For export-oriented projects, how do ICBC project loan staffs assess the international market?

We mainly focus on the international trend of industrial sector of the project. We have some literatures on this from the authorities. Such as the industrial category in the national industrial policy, in which it speculate which sector is supportive and which is to be maintained or forbidden. The literature review first starts from the future trend in the world and then limit to the detailed product of the project itself.

2 How you assess the environmental requirements in the international market?

It is based on the framework provided by our bank (ICBC). The framework is based on the national industrial policy, which is keeping in line with the international trend in the world and is revised every year or every two years. The national industrial policy has taken the environmental protection into consideration.

3 Do you have differentiated policy on the environmentally sound projects, such as CP project?

Yes, we have. For environmental protection projects, such as wastewater treatment, are generally of low profitability. Banks, as enterprises today, mainly care about the profitability of themselves. Before 2000, there was one chapter in the project loan appraisal report about the project's effect on national economy. But now it does not include that chapter anymore. For that is the business of the government, not our work. The environmental effect is considered when we assess the conditions of the construction of the project; such as, how could the project contribute to the environment protection?

4 Do you have environmental risk consideration when you assess the risks of a project?

In the project assessment, we consider various risks and effects. It is critical to find out the risk resources and the measures to manage them. The main tool is term management and post loan monitoring. For environmental issues, it is not necessary to write too much, maybe one or two lines of words. It is mainly of qualitative analysis, no quantitative analysis. For example, we noticed that with the higher environmental protection requirement, one

supportive industrial sector in the national industrial policy today might be out of support in the future.

5 Do you have experienced case that a project was in line with the environmental standards when it was appraised but years later they are not?

Yes. For example, small coal thermo-power plant under 50,000 kilowatts was once supported in the national industrial policy. The purpose was to encourage increase the electricity supply to meet the increasing demand. But today, it is recognized that it is highly polluting and energy consuming, and does not match the scale economy principle; it is listed in the forbidden category.

## Appendix-6 Interview on working staff of ICBC, Sichuan Provincial Branch

Interviewee: Mr Kang

Aim: To understand if the closure of the polluting factories in Minjiang River Basin and Tuojiang River Basin have influenced the asset security of local ICBC branch

Time: Aug. 25, 2004

Tel: 86 28 86718796

Question:

1 Did the closure of the polluting factories in Minjiang River Basin and Tuojiang River Basin have influenced the asset security?

Sorry, we cannot make sure you (the author) are an employee of ICBC, and we cannot provide any information. We care about the security of our assets. For the polluting issues you mentioned, nobody could give a clear explanation. Via internet, you can find a lot of reports on this from various media.

## Appendix-7 Interview (2) with the Financial Manager of the Shandong Binzhou Huanghe Paper Group Co., Ltd

Interviewee: Mr Zhou Yongge

Aim: To understand what the commercial banks' attitude to CP projects is.

Time: Aug. 27, 2004

Tel: 86 13506376598

Questions:

When your company planned to invest in the CP project (in China we call it pollution prevention project), what was the attitude of the local commercial banks?

Answer:

To meet the higher environmental standards then, we had to invest a lot in the pollution prevention projects; otherwise we would be forced to close by the authority due to insufficient capability to meet the set standards. In 1997, we decided to invest more than RMB47 million in a wastewater (sewage) treatment project first in 1998 and RMB51 million in an Alkaline Recycling project later. We could not generate such large amount of funds for the investment; we had to squeeze cash from the business operation activities. We went to the local commercial bank applying for loan, but none of them were willing to finance such kind of projects and due to the financial constraint, the commercial banks squeezed their credit line to our company or stopped new loan input. We had to turn to raising money from the staff of our company and joint venture and other external financial resources. But everything is ok now, as we mentioned last time!

## Appendix- 8 Case Study Fuyang Chemical General Works: A Cleaner Production Success Story

This case study was prepared by the China-Canada Cooperation Project in Cleaner Production, available at: <http://www.chinacp.com/eng/cpcasestudies/casestudy3.html>

### Fuyang Chemical General Works: A Cleaner Production Success Story

June 1999

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Summary

Employees and management have readily adopted Cleaner Production (CP) concepts at the fertiliser plant of Fuyang Chemical General Works. The plant, located in Fuyang City in Anhui Province of China, produces ammonium bicarbonate and urea fertilisers.



In a project funded by the Canadian International Development Agency, Canadian engineers, process specialists, and others worked closely with the State Administration of Petroleum and Chemical Industries and Fuyang plant personnel to develop practical no and low cost solutions to improve productivity and profitability and to reduce pollutants. The project started in 1996 and has focused on minimising water consumption, efficient use of raw materials and energy, recycling of materials, improved housekeeping, and careful and safe handling of raw materials, intermediate products, and finished goods. In the first full year after implementing many of the no and low cost solutions, the company realised an increase in production of three percent, while saving 15 Million Renminbi (CDN\$ 2.8) by picking so-called 'low hanging fruit'. Credit goes to the employees who quickly rose to the challenge and embraced the principles of CP. Equal credit goes to management who fully committed to the program and indeed challenged and empowered employees to find solutions who were then rewarded for their initiatives and successes by bonuses.

#### Introduction

China's leaders have given Chinese industry notice that it must become more productive, that it must improve its profitability, and that it must reduce the mass loading of pollutants that it emits to the environment. Failure to do so means plants being closed. Pressure to improve is even more intense in important river basins such as the Huai He. Canada has committed to help Chinese industry by launching a five year CDN\$ 9,000,000 project to provide assistance for Cleaner Production in four industrial sectors, one of which is the fertiliser industry. Funding for the China-Canada Co-operation Project in Cleaner Production is being provided by the Canadian International Development Agency (CIDA). Major Canadian participants in the project include: PricewaterhouseCoopers LLP, SNCw Lavalin Environment and ESSA Technologies. Chinese partners include the State Economic and Trade Commission (SETC) which is the Chinese Executing Agency, the State Environmental Protection Administration (SEPA), the Anhui Provincial Economic and Trade Commission (AHETC), the State Administration of Petroleum and Chemical Industries (SAPCI), and the State Bureau for Light Industry (SBLI). Strong support and encouragement also came from the Governor of Anhui Province and the Mayor of Fuyang City. Management of the Fuyang Chemical General Works fertiliser plant in Fuyang, Anhui Province agreed that their plant would be the demonstration site for Cleaner Production for China's fertiliser industry.

### The Business Case for Cleaner Production

The United Nations Environment Programme (UNEP) defines Cleaner Production as "the continuous application of an integrated preventive environmental strategy applied to processes, products, and services to increase eco-efficiency and reduce risks to humans and the environment". UNEP also states that, in production processes, "this means conserving raw materials and energy, eliminating toxic raw materials, and reducing the quantity and toxicity of all emissions and wastes".

UNEP goes on to state that: "Cleaner production requires changing attitudes, responsible environmental management and evaluating technology options. Other preventive approaches, such as eco-efficiency and pollution prevention, serve similar goals." And that "Much of the current thinking on environmental protection focuses on what to do with wastes and emissions after they have been created. The goal of cleaner production is to avoid generating pollution in the first place - which frequently cuts costs, reduces risks and identifies new opportunities. Cleaner production can be the most efficient way to operate processes, produce products and to provide services. Costs of wastes, emissions and environmental and health impacts, can be reduced and benefits from these reductions and new markets can be realised."

Thus, cleaner production concepts are really just a sound business approach which, when implemented, reduce production costs and increase profitability. The plant becomes more competitive in the process, while at the same time reducing environmental impacts, risks and potential liabilities.

#### Fuyang: The Road to Success - Project Description and Participants

The project to implement cleaner production at the Fuyang Chemical General Works fertiliser plant is one of two demonstration projects under the China-Canada umbrella project. The fertiliser CP program started with a review of four (4) plants including that of Fuyang Chemical General Works. The latter was chosen as the demonstration site. Among key features of this fertiliser plant were profitability and commitment from management to becoming more competitive and profitable while being better able to meet the pollution standards that were being imposed.



SNCw Lavalin Environment of Montreal, Canada and the engineers at the Environmental Protection Research institute of the Bureau of Chemical Industry, in Beijing, PRC,

provided the process and engineering input to assist Fuyang company management and plant staff to move quickly and successfully towards implementing cleaner production. The interface between (a) plant management and staff and (b) the Canadian and Chinese engineers was critical. From the outset professional and personal relationships developed which translated into quick implementation of alternatives supported with enthusiasm by all participants.

Many other entities have been, or continue to be involved in the Fuyang location and in the wider scope of the project. Their roles and contributions, and their impacts on the project, are described elsewhere in this case study.

### Approach Used in the Cleaner Production Project

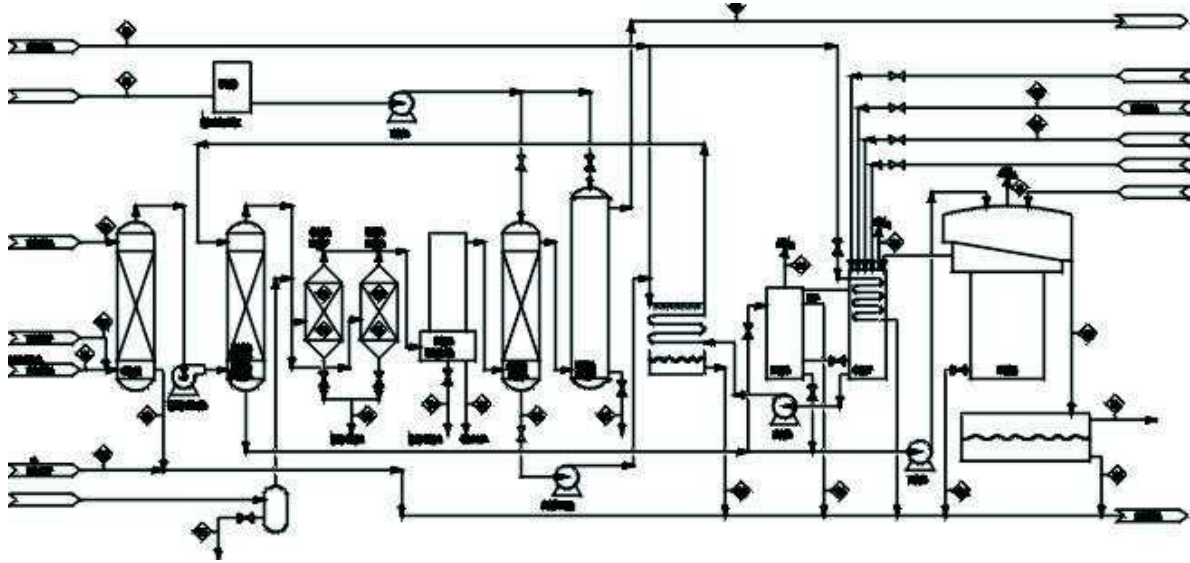
Once the plant was chosen, engineers and process specialists from SNCw Lavalin in Montreal as well as from Beijing undertook an on-site cleaner production audit with full participation of plant process and manufacturing staff.

### Preparation of Process Flow Diagrams

The basic methodological step in the Clean Production (CP) audit was the preparation of the Process Flow Diagrams (PFDs). PFDs are the key to developing clean production solutions. Twenty-eight PFDs were developed for the Fuyang Fertiliser Plant as part of the CP Audit. Each of them describes a specific unit process, including all major pieces of process equipment (pressure vessels, reactors, scrubbers, coolers, pumps, etc.), and process streams. Using the engineering information from the PFDs, it then became possible to systematically assess the environmental emissions (liquid effluents, air emissions and wastes) from every pieces of process equipment. On this basis, a detailed list of all environmental emissions was prepared, indicating the sources (i.e. equipment number), the nature (stream number), the point of discharge, the general composition and the frequency (e.g. continuous emission, intermittent emission, blow downs, periodic from maintenance, etc.)

Example of Process Flow Diagram  
Prepared during the Process Audit





### Sampling and Flow Measurements

The preparation of Process Flow Diagrams was the basis to first identify the sources of environmental emissions from the ammonia/urea manufacturing process, and second to select the major streams (emissions) to be included in the field sampling program.

Sampling points were selected based on the PFDs. They included sampling at the source (process equipment) as well as at various locations along the sewer network. In addition to taking samples, flow measurements were carried out at each of the sampling points. Samples were all analysed at the plant laboratory or using a portable laboratory.

### Water and Material Balance

The PFDs and the results from the sampling program then lead to the third methodological step in the CP audit, which is the development of the water balance and pollution loads analysis.

The ultimate information which is brought to light from this step of the CP audit is the priority process areas and priority process emission streams for which CP solutions will have to be developed.

### Development of CP Solutions

In the case of the Fuyang Fertiliser Plant, the above CP audit resulted in clearly identifying two (2) priority process areas and seven (7) process streams which were responsible for up to 60% of the pollution due to the losses of ammonia to the air and to the sewer.

Not only do the losses of ammonia to the atmosphere and to the sewers result in a major pollution problem (ammonia is highly toxic to the aquatic life and depletes oxygen in the receiving water bodies), but they also represent a loss of revenues to the plant. Since ammonia is the main finished product manufactured by the plant, losses to the air and to the sewers turns out to be a loss of revenues as well.

Under the CP audit, it was estimated that millions of RMB were wasted to the sewers by the losses of ammonia from the priority process areas identified by the audit. This became the basis for developing Clean Production measures which would target the two priority process areas and the seven (7) priority process streams.

#### List of Clean Production Measures

Having clearly identified the seven (7) process streams (sources of pollution) which accounted for up to 60% of the ammonia losses, the SNCw Lavalin, SAPCI and Fuyang Plant engineers went back to the Process Flow Diagrams and used them to study alternative schemes to recycle and/or recover these streams. In order to assess the technical feasibility of some of the CP solutions, state-of-the-art computer process simulation models were used by the Canadian and Chinese Engineers. The list of CP measures which were studied and implemented is presented in Table 1.

The set of CP measures were all targeting the priority sources of ammonia losses to the environment (up to 60% of total losses). In addition, the Fuyang Plant also developed and implemented six other zero and low cost CP measures in various areas of the plant operation:

- Elimination of broken fertiliser bags on the ground at the storage area. This measure results in considerable reduction of the contamination of storm run-off by nitrogenous compounds.
- Generating revenues from wastes. Installation of a new settling pond at the power plant to improve the removal of suspended solids from the stack scrubbing liquor. This measure also resulted in increasing the revenues from selling settled solids as a material for various construction applications under Chinese practices.
- Maximising oil recovery for recycling and reuse. New equipment was added to recover oil from the process gas following gas compression.
- Preventing leaks of copper solution from storage tanks and filter-presses. This measure resulted in savings on the cost of chemicals (copper solution) in addition to eliminating the contamination of water with chemicals.
- Aesthetic site improvements. Cleaning of a dump area and conversion into a garden.
- Minimising the discharge of wasted oils by manual recovery of free oil from the sewers.

TABLE 1

Fuyang General Chemical Works  
List of CP Measures Implemented  
under the Canada-China Cleaner Production Project

Environmental Considerations and Business Operations of Commercial Banks in China

Stream Number	Stream Identification	CP Measures	Goal of CP Measure	Cost Category
1	Air emissions of ammonia from the mother liquor tanks	Collect air emission; and direct to a wet scrubber	Reduce atmospheric emissions. Improve occupational health Recover ammonia from air to liquid	Low cost
2	Air emission of ammonia from the bagging operation	Ventilation, air collection and scrubbing of the air at the wet scrubber	Reduce atmospheric emissions. Improve occupational health Recover ammonia from air to liquid	Low cost
3	Scrubbing liquor	Recycling at other process unit	Prevent discharge to sewer	Low cost
4	Bleed from integrative tower	Recycling at other process unit	Prevent discharge to sewer	Low cost
5	Bleed from CO/CO <sub>2</sub> trace removal	Recycling at other process units	Prevent discharge to sewer	Low cost
6	Bleed from isobaric absorber	New equipment for the concentration, recovery and reuse of ammonia	Prevent discharge to sewer Recover ammonia Reduce raw material Generate revenues	Medium cost
7	Supernatant from sulphur wastes at the gas desulphurisation area	New equipment for the recovery of sulphur, extraction and recycling of diluted ammonia	Convert sulphur wastes into saleable products Reduce losses of ammonia to the air Prevent discharge of ammonia to sewer	Medium cost
8	Ammonia condensate from the collection of	Manual collection of the condensate	Prevent discharge to the sewer Recover and reuse of	Zero cost

	contaminated air at the bagging area	before it reaches sewers; return to recovery	ammonia	
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### Implementation of Medium Costs CP Solutions

The China-Canada CP Project provided financial support to the implementation of two medium costs CP solutions. These are the CP measures Nos 6 and 7 in Table 1.



Following a joint recommendation by the Chinese and Canadian technical teams, the implementation of these two CP solutions was carried out as per the following steps:

- Engineering and equipment specification in a joint work by the Canadian and Chinese Technical Teams.
- Cost estimating for equipment, civil, structural and electrical by the Chinese Technical Team.
- Preparation and issuing of tender documents for the fabrication of equipment.
- Selection of bids and purchasing of equipment.
- Civil, structural and electrical work at the plant by Fuyang personnel.

- Mechanical installation by Fuyang plant personnel.

The two (2) CP solutions are currently fully installed at the Fuyang Plant. As of now, they have reached the final stages of commissioning.

#### Accomplishments and Rewards Benefits

CP measures Nos 1 to 6 in Table 1 were not separate action items. Indeed, they are all integrated into one global scheme for pollution reduction at the source. The estimated benefits resulting from the implementation of these CP measures are considerable:

Total reduction of ammonia losses to the environment (air emissions and liquid effluents)	4 500 tons/year
Total estimated net revenues generated from the recovery of the ammonia losses	3 Million RMB/year

The CP measure N° 7 in Table 1 also resulted in substantial benefits:

Total estimated reduction of ammonia losses to the environment	250 tons/year
Total estimated net revenues including both ammonia recovery and sale of recovered sulphur	0.4 Million RMB/year

#### Management Commitment and Employee Empowerment/Participation

Successful implementation of cleaner production happens when good management practices are in place which are coupled with a well operated and maintained plant that operates energy efficiency programs and programs to reduce the use of resources and waste. It is always the case that full commitment of management and the buy-in by operating staff are key ingredients to success. The Fuyang Chemical General Works demonstrated just how much impact this has had on the success of the project. From the outset Fuyang management were enthusiastic and fully committed to this project.

#### The Role of Policies and Guidelines

One element of the overall project included the involvement of Canadian specialists in environmental policies, regulations and guidelines working with Chinese government agencies and cleaner production centres, and staff from Fuyang, to ensure that these necessary elements were incorporated into the project. These Canadian specialists provided an insight into how Canada has been successful in joint industry-government initiatives to develop policies and regulations that encouraged successful implementation of CP concepts

in Canadian industry while at the same time reducing the discharge of pollutants. They reviewed China's environmental regulations and policies with respect to CP (including barriers to implementing CP) and made recommendations that, when put in place, would encourage the move to CP.

As well, the China-Canada CP Project resulted in the preparation of a new Clean Production Guidelines for the ammonia/urea industrial sector. This guideline provides a practical tool to the Chinese fertiliser industry for carrying out clean production process audit and for developing and implementing clean production measures.

### The Role of Information Technology

Another element of the China-Canada project includes installing a computer in Fuyang with linkages to the project Web page. This enables the factory to link up with Cleaner Production centres and centres of expertise in China and around the world. This computer will also be used to store and analyse data taken from the new measuring and monitoring equipment provided to the plant by the project.

### The Role of Training

The plant management and staff have received process improvement training as well as detailed on the job training from our Canadian team members. Several plant managers have also participated in technical study tours to Canada.

### Gender Equity

The Canadian International Development Agency (CIDA) has a Gender Equality Policy that requires all its projects "to support the achievement of equality between women and men to ensure sustainable development". The CP Project therefore, includes special efforts to promote women's participation in all project- training programs and within the Project's partner agencies and enterprises. The project is achieving its target of 30% women in all its training programs.

A Local Gender Equity Consultant is working with project counterparts in Beijing, Hefei and at Fuyang to raise awareness about gender issues and to promote gender equity. Workshops discussing reasons for the lack of women at management levels in the factory have generated a great deal of interest. A national workshop on Gender Equity and Development was held in Beijing to discuss gender issues in the workplace. As a result, a new NGO was created called the Women and Environment Network (WEN), with the objectives of publicizing gender and environment issues and undertaking activities promoting environmental awareness. The leaders of this group will be extending the Network to the provincial and factory levels through a second Gender and Development Workshop in Hefei. (For more information see WEN website: [http://sdep.cei.gov.cn/envir\\_sub/index/ja.asp](http://sdep.cei.gov.cn/envir_sub/index/ja.asp))

### Sharing the Success Story - The Wider Impact

The project to implement cleaner production at Fuyang has been a success story as evidenced by the benefits described above. Fuyang management have agreed that they

would share this information with other industries in China and elsewhere so that others might speed implementation as well. Some examples of how this success story might be shared include planned publication of this case study in Chinese and English on the project web site.

With the close involvement of SETC, SEPA, other state ministries, AHETC, and other organisations many opportunities exist to distribute the case study and ongoing successes to other fertiliser manufacturers in China and to other industry sectors which want to implement or advance their own Cleaner Production programs.

As well, there has been interest in the United Nations Environment Programme (UNEP) through its Paris-based Industry and Environment office to place the case study on its Cleaner Production web site where UNEP accumulates similar success stories made available by other companies. Often, UNEP makes printed copies of these success stories available to attendees in Cleaner Production workshops that UNEP holds in developing countries.

### Conclusions

The Canada-China Co-operation Project in Cleaner Production demonstration project at the Fuyang Chemical General Works fertiliser plant in Fuyang City, Anhui Province has truly been a success story. The plant has made important productivity improvements, has reduced production costs, has seen improved energy efficiency, and has reduced the load of pollutants discharged to the environment. This is an excellent example of how a focus on implementing Cleaner Production can make a significant difference. The important elements that make this a success story include: management commitment, employee participation and support, designing a program where the no-cost and low-cost program elements were tackled first to get the most benefits with the least amount of money, training and sharing of information, and partnerships with government agencies and others. Cleaner production program elements will continue to be implemented and management and staff have put in place a continuous improvement (CI) process.

Sharing this success story with others is a logical next step and management has committed to do this.

See Fact Sheet related to this Case Study

See Fuyang Factory Main Page

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