



INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

"KEY ELEMENTS FOR A SUSTAINABLE WORLD: ENERGY, WATER AND CLIMATE CHANGE"

CP Promoting System in China

Yin Jie ^a, Duan Ning ^b, Yu Xiuling ^c, Bai Yanying ^d

a. China National Cleaner Production Center, Beijing, yinjie@craes.org.cn

b. China National Cleaner Production Center, Beijing, ningduan@craes.org.cn

c. China National Cleaner Production Center, Beijing, yuxl@craes.org.cn

d. China National Cleaner Production Center, Beijing, baiyy@craes.org.cn

Abstract: Cleaner Production has been introduced into China since 1993. After the development in nearly two decades, a comparatively completed cleaner production promoting system has been established in China. This paper makes a detailed illustration on the regulatory system, administrative system, technical supporting system and educational system for promoting cleaner production in China. Furthermore, the paper proposes some recommendations for the further development of cleaner production in China.

Key words: cleaner production, China, promoting system, recommendations

Cleaner Production (CP) was firstly proposed by the developed countries, and promoted and disseminated by the UN in the world to prevent the generation of wastes from the very beginning of production process and further to protect the whole environment at a high level. In 1993, the first CP project "Promoting CP in China" was initiated by the World Bank in China, which firstly introduced CP into China. After nearly two decades, China has formed an all-round promoting system for CP, including regulatory system, administrative system, technical supporting system and educational system.

1. Regulatory System

Since 1990's, China has prepared and issued several governmental documents and regulations for promoting CP. After the development in nearly two decades, China has formed its regulatory system based on the national situation. The general regulatory system from promoting CP in China has been described in Chart 1.

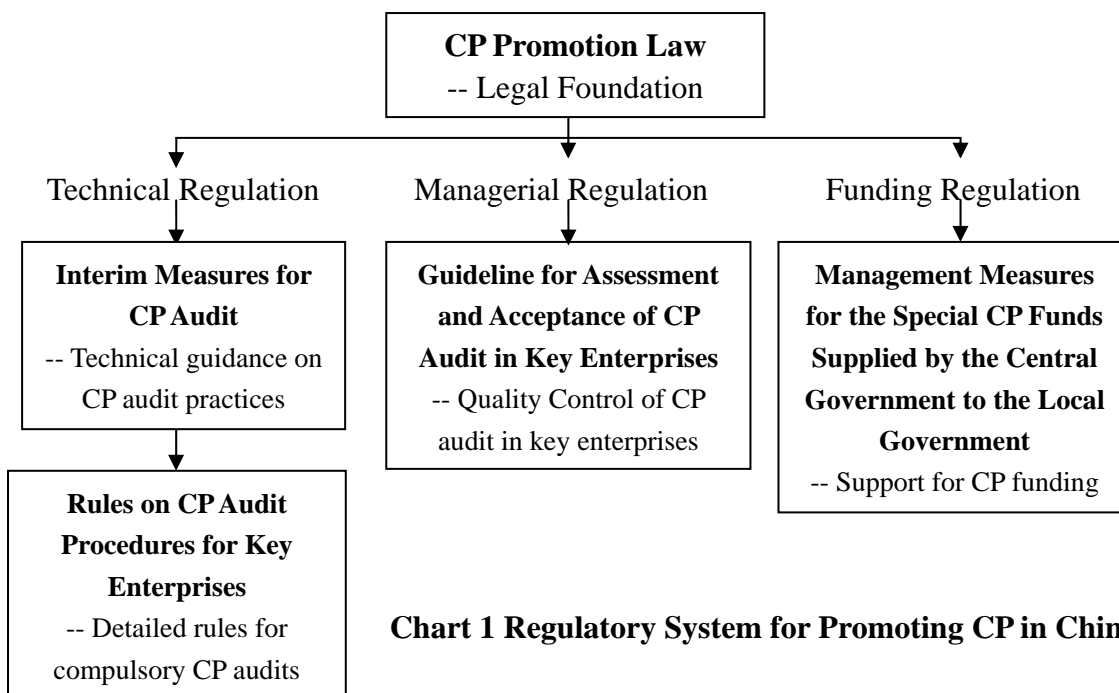


Chart 1 Regulatory System for Promoting CP in China

1.1 CP Promotion Law

After the promotion and practice in CP audits over a decade, CP has been accepted by Chinese government and industries progressively. In order to eliminate all the barriers encountered in the promotion of CP, and to guarantee the effectiveness and efficiency of the CP initiatives, China put forward its first CP legislation, the CP Promotion Law of the People's Republic of China in 2003. From then on, the legal foundation of CP in China had been laid.

The law is just fitting for the national situation of China, with promotional and encouraging purposes. It aims promoting CP in China, so as to enhance the utilization rate of resources, reduce the generation of wastes, and furthermore protect and improve the environment and health of human beings, eventually it can help the sustainable development of the whole economy and society.

The CP Promotion Law defines the specific responsibilities of each governmental body at national and local levels. The law also makes detailed description on the implementation of CP and encouraging measures.

The law requires two categories of enterprises carry out CP audit, which reflects the characteristics of China as a developing countries. The two categories of enterprises cover those enterprises that exceed the national or local discharging standards or exceed the total volume control targets for pollutants set by the relevant local people's governments and those enterprises that use toxic and hazardous materials in production or discharging toxic and hazardous substances.

As a developing country, China is quite different from the developed countries in the industrial development. Most of the enterprises have poor capability to meet the national environmental requirements. Under this circumstance, it needs China to use some administrative measures to ask those enterprises with poor environmental

behavior update its technological process and management level, depending on CP audit, so as to meet the minimum environmental standards in a comparatively short period.

The issue of the law indicates China has stepped into a legal stage of CP promotion, which also lays firm foundation for the formulation of the relevant regulations and rules.

1.2 Technical Regulations

1.2.1 Interim Measures for CP Audit

In 2004, the National Development and Reform Commission (NDRC) and the former State Environmental Protection Administration (SEPA) jointly issued the Interim Measures for CP Audit, which is a most important supplement for the law.

The Interim Measures for CP Audit puts forward specific requirements on CP audit, the most usable implementation tool of CP strategy at enterprises level. It also provides detailed procedures for CP audit. A new concept of compulsory CP audit has been firstly brought out in the Interim Measures. That means the two categories of enterprises have to carry out the CP audit compulsorily, so as to help them to meet the environmental requirement in a stable condition.

Rules on CP Audit Procedures for Key Enterprises

As mentioned above, the Interim Measures is a specific regulation for CP audit, which fits for all the companies in China and aims at the promotion of voluntary CP audits. However, there still is an urgent demand for a regulation special for compulsory CP audit. Hence, the former SEPA issued the Rules on CP Audit Procedure for Key Enterprises with a defined target on the key enterprises that should carry out compulsory CP audit.

The Rules contains 12 chapters, focusing on how to implement a compulsory CP audit, and it stresses the responsibilities of environmental administrative bodies at each level.

1.3 Managerial Regulations

● Guideline for Assessment and Acceptance of CP Audit in Key Enterprises

The implementation of several law and regulations promoting CP greatly encourages the CP audits in enterprises. But the quality of the audit can not be well controlled by the government, because it largely relies on the market-based consulting activities. In July 2008, the Ministry of Environmental Protection (the former SEPA) put forward the Guideline for Assessment and Acceptance of CP audit in Key Enterprises. The Guideline requires that the local environmental administrations have to carry out an assessment and acceptance on all the compulsory CP audits in the two categories key enterprises according to the specified procedures and standards.

The Guideline stipulates two-step procedure, the first step is the assessment of the CP audit and the second one is the acceptance of the CP audit. The first step focuses on the working process of CP audit to identify the truth of the CP audit report and the estimated effectiveness of the CP options generated from the audit. And the second

step has its emphases on verification of the real results from the mid/high cost CP options, and gives the audit a final conclusion.

The Guideline helps the environmental administrations control and monitor the quality of compulsory CP audit at a higher level, and guarantees the real effectiveness of the CP audits.

1.4 Funding Regulations

● Management Measures for the Special CP Funds Supplied by the Central Government to the Local Government

After the CP Promotion Law came into effect in 2003, the Ministry of Finance published a regulation on funding, i.e. the Management Measures for the Special CP Funds Supplied by the Central Government to the Local Government.

The Special CP Funds is arranged by the central budget for supporting the medium and small sized enterprises (SMEs) in key industrial sectors to carry out CP initiatives. The key industrial sectors cover the heavy polluting industries, including petrochemical, metallurgy, chemistry, light industry, textile and building materials. The SMEs refers to the enterprises with less than 2000 employees, or with less than RMB 300 million yuan (about USD 44 million) of the sales, or with less than RMB 400 million yuan (about USD 59 million) of the total assets.

The Special CP Funds will be allocated in the term of subsidy for the following CP projects:

- (1) All the CP projects focusing on the source reduction of pollutants, including improving the product design, using nontoxic raw materials and cleaner or renewable energies, and applying advanced low-material-consumption technologies and equipments.
- (2) All the CP projects reducing pollutants from the process control, such as updating the production lines, improving management level and strengthening the on-site monitoring.
- (3) All the CP projects that reuse or recycle all the waste materials, water and energy.
- (4) All the CP projects that apply mature CP technologies and processes, which are appropriate for demonstration and dissemination.
- (5) Other CP projects that can be demonstrated and promoted.

2. Administrative System

Since the CP Promotion Law came into existence in 2003, China has established its administrative system for promoting CP, according to the provisions in the law. The existing administration system of China for promoting CP has been shown in the following Chart 2.

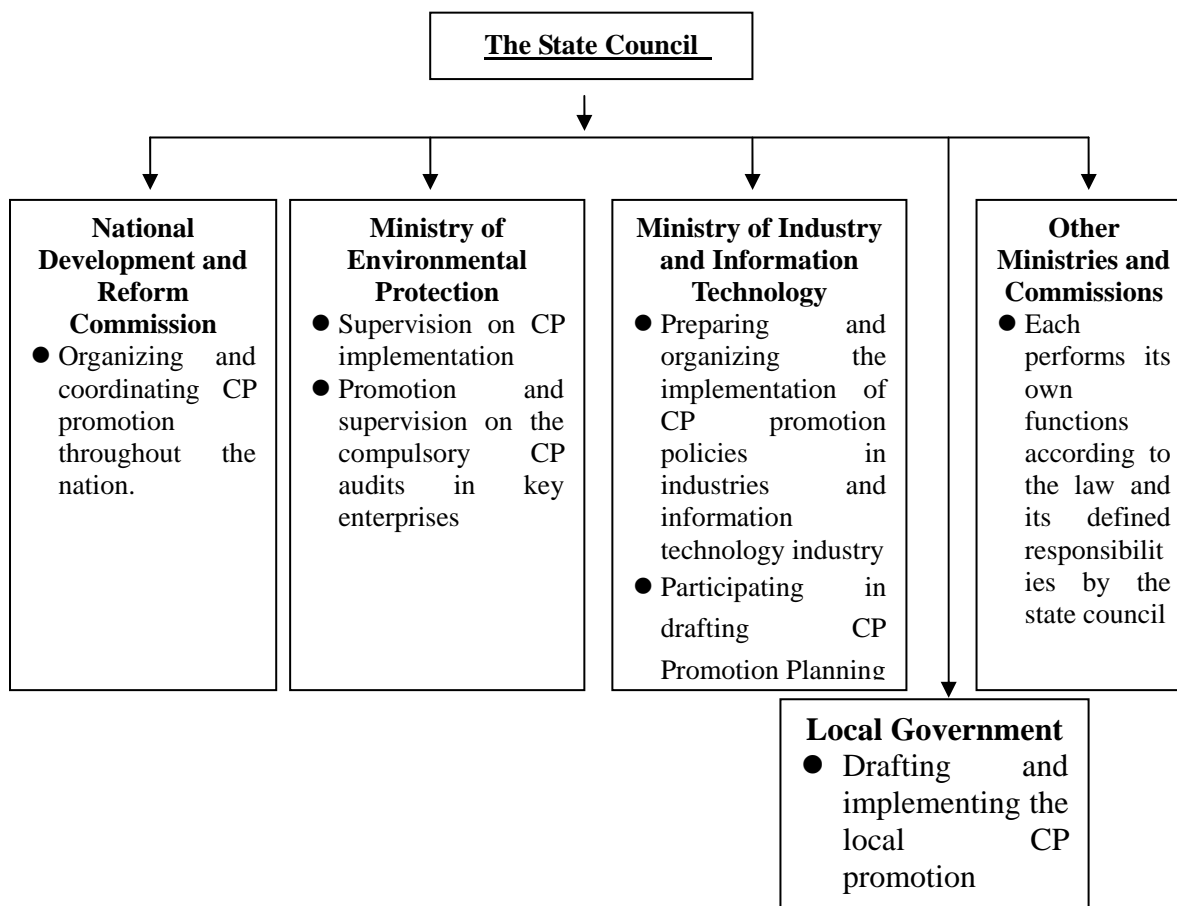


Chart 2 Administrative System for Promoting CP in China

In the existing administrative system for promoting CP in China, there are 3 ministries play significant roles, including the National Development and Reform Commission (NDRC), the Ministry of Environmental Protection (MEP) and the Ministry of Industry and Information Technology.

- **National Development and Reform Commission (NDRC)**

As the macro-economy regulating and controlling administrative department of China, NDRC takes the full responsibility to coordinate and organize the CP promotion in China.

Up to the date, NDRC has accomplished a lot of initiatives to promote CP in China. For instance, NDRC organized the drafting of the CP Promotion Law and issued the Interim Measures for CP Audits jointly with MEP. From the technical aspect, NDRC published the three CP Technology Inventories for the Key Sectors in China and the CP evaluation indicators system for 24 sectors. It also initiated a project of CP demonstrative Cities, and organized a large number of activities and campaigns to publicize and disseminate CP. All of these have greatly been boosting CP in China.

- **Ministry of Environmental Protection (MEP)**

MEP (the former SEPA) is the first governmental body to introduce CP into China and launce pilot projects of CP audits at enterprise level. As stipulated in the Law, MEP is mainly responsible for the supervision of CP implementation, and

promoting and regulating compulsory CP audits in key enterprises (i.e. the two categories of enterprises). So MEP also plays a key role in the administrative system for promoting CP in China.

MEP has issued two important regulations to give guidance to the local environmental administrations in the compulsory CP audits in key enterprises, i.e. the Rules on CP Audit Procedure for Key Enterprises and the Guideline for Assessment and Acceptance of CP Audits in Key Enterprises. These governmental documents stimulate the compulsory CP audits greatly. Only in 2007, more than 1500 enterprises carried out CP audits, and achieved sound economic returns and environmental benefits. For example, they saved water for 380 million tons, electricity for 3.69 billion kWh, and made a total economic return of RMB 5.89 billion yuan (USD 866 million). In the meanwhile, all the enterprises reduced COD by 95,000 tons and SO₂ by 71,000 tons through the implementation of the CP options. In addition, MEP has also prepared and published the CP Standards for 42 industries, and now is organizing the compilation of guidelines for CP audits in nearly 100 sectors.

- **Ministry of Industry and Information Technology (MIIT)**

MIIT is a new ministry just established in 2008, who has a clear function to Preparing and organizing the implementation of CP promotion policies in industries and information technology industry, and participating in drafting CP Promotion Planning. Since the industries are key area to implement CP, the MIIT is another most important ministry in China to promote CP nationwide.

3. Technical Supporting System

From the very beginning when CP was firstly introduced, China has been putting great efforts in establishing a technical supporting system for promoting CP based on both the experiences of the developed countries and the real national situation as a developing country. With the efforts for nearly two decades, China has initially formed its technical supporting system with Chinese characteristics, shown as in Chart 3 the Technical Supporting System for Promoting CP in China

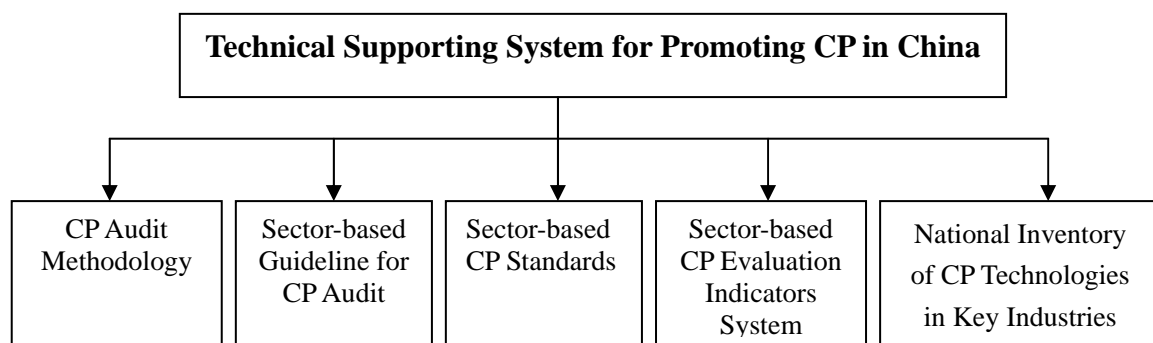


Chart 3 Technical Supporting System for Promoting CP in China

3.1 CP Audit Methodology

During the first decade after CP was brought into China, CP audit were mainly carried out depending on various international cooperation projects and domestic pilot projects. The practices in CP audits in these projects have provided rich experiences

to study and establish the CP audit methodology with Chinese characteristics. China has improved the methodology developed and promoted by UNEP/UNIDO from 5 phases to 7 phases, including the planning and organization, pre-assessment, assessment, option generation and screening, feasibility analysis, options implementation and sustaining CP. This 7-phase CP audit methodology has been widely adopted in China and nearly all the CP audits finished in China follow this procedure.

Since the CP Promotion Law put forwards the concept of compulsory CP audit in the two categories of enterprises. China modifies its CP audit methodology according to the requirements of compulsory CP audit, and the updated methodology has two major characteristics.

The first one is that the CP audit aims at compliance of emission standards, but not only the reduction of generation and emission of pollutants. Because for the two categories of enterprises, the first thing they have to do is to emit pollutants steadily below the national or local emission standards.

The second one is that the CP audit put focuses on the generation of mid/high cost options, instead of the non/low cost options. The technology-oriented options become the key measures for the CP audit, but not the management-oriented, so as to update the technological level of industries in China.

3.2 Sector-based Guidelines for CP Audits

The Sector-based Guideline for CP Audit is developed for a specific sector, which makes a full description and evaluation of the whole sector's technical level and pollution situation. It also provides detailed analysis on each key process of the sector, and then puts forward a list of CP options, which covers management-oriented options and technology-oriented options. The guideline aims at assisting the enterprises in this sector have a quick and thorough picture of the whole sector, and the development future of the sector. It gives the enterprise a clear and specific technical support to carry out a sufficient and effective CP audit.

Since the first batch of CP Audit Guidelines in 4 sectors including chemical raw materials, silk dyeing, electroplating and brewing in 1990's, China has developed several guidelines of CP audits for cement, hotels, fertilizer, steel and petroleum refining, etc.. Now MEP is organizing the compilation of CP audit guidelines for nearly 100 sectors.

3.3 Sector-based CP Standards

MEP (the former SEPA) initiated the compilation of CP standards in 3 sectors (electroplating, brewing and pulp and paper) in 2000. Depending on the findings and results from the first 3 CP standards, China has established its framework for CP standards, containing 3 levels and 6 categories of indicators.

The CP standard evaluates and classifies the enterprises in the target sector into 3 levels, i.e. international advanced level, domestic advanced level and the general level, which is the basic requirement of the CP standard.

The CP standard uses 6 categories of indicators to make the evaluation and classification, including the indicators for production process and equipment, that for resources and energy utilization, that for products, that for pollutants generation, that

KEY ELEMENTS FOR A SUSTAINABLE WORLD: ENERGY, WATER AND CLIMATE CHANGE

for wastes reuse and recycling and that for environmental management.

MEP is in charge of this work, and by the end of 2008, MEP has published the CP standards for 42 sectors, which provide strong technical support to CP in China.

3.4 Sector-based CP Evaluation Indicator System

The Sector-based CP Evaluation Indicator System is used to evaluate the CP level of the enterprises in the target sector. It has a set of indicators with different weights and scores. All the enterprises in the target sector can be given a total score after a specific procedure of evaluation, and then they can be classified into two levels according the scores. The first level is Advanced CP Enterprise, which represents the enterprise reaches the advanced CP level within China, and the second level is CP Enterprises, which means the enterprise is located at the normal CP level within the country.

Within the CP evaluation indicator system, there are four categories of quantitative indicators to evaluate the CP level of enterprises, including indicators for energy consumption, that for resources consumption, that for comprehensive utilization of wastes and that for pollution emission. In addition, the indicator system also contains three categories of qualitative indicators, i.e. indicators for policy compliance of the national or sector requirements for CP technologies, that for CP management and that for EMS and compliance of national and local environmental standards.

NDRC is responsible for organizing the compilation of the CP Evaluation Indicator System, and up to the date, it has published the CP Evaluation Indicator System for 24 sectors, including nitrogenous fertilizer, electroplating, steel, battery, pulp and paper making and dyeing sectors.

3.5 National Inventory of CP Technologies in Key Industries

In order to promote CP in all rounds, lead enterprises to apply advanced CP technologies and processes and actively prevent and control industrial pollution, NDRC started the preparation of the National Inventory of CP Technologies in Key Industries in 2000.

These CP technologies are all recommended and evaluated by the sector administrations and verified by the experts committed by NDRC. The technologies have been proved in production practices with obvious benefits in terms of economic, environmental and social, which can be easily disseminated and applied within the target sector and the similar sectors.

The Inventories cover the key sectors involved, the description of CP technologies, the application scope, the details of the technologies, and the analysis on its investment and benefits.

NDRC has published 3 batches of the Inventories in 2000, 2003 and 2006 respectively. The first Inventory includes 57 CP technologies in 5 key sectors, i.e. metallurgy, petrochemical, chemical, light industry and textile. The second one involves 56 CP technologies in 5 key sectors, i.e. metallurgy, mechanical, non-ferrous metal, petroleum and building materials. The third one covers 28 CP technologies in

7 key sectors, i.e. steel, non-ferrous metal, power, coal, chemical, building materials and textile.

The economic and trade administrations at each level use the Inventories as the technical bases for recommending and approving CP projects.

4. Education and Training System

The educational and training system has been also established initially in China, including the basic education, vocational training, governmental officer training and propaganda.

Basic Education

The CP Promotion Law stipulates that the relevant administrative departments responsible for education under the State Council shall integrate relevant courses of study on cleaner production technologies and management into higher education, professional education and technical training programs.

Now in China, over a half of the colleges and universities with the major of environmental protection has set optional course for CP. More than tens of thousands of students receive CP education through basic education.

Vocational Training

CP especial CP audit is a professional and technical task, which needs the auditors have rich knowledge on CP methodology and specific sectors. They need a vocational training before a CP audit initiated. Therefore, China designs and delivers vocational training courses for the technicians who are engaged in CP, i.e. the National Training Course for CP Auditors.

MEP requires all the people involved in the compulsory CP audit have to attend the National Training Course for CP Auditors and get the certificates.

The National Training Course for CP Auditors is a 5-day course, which emphasizes on the CP methodology and technical skills in CP audits. The trainees come from the research institutions, consulting firms, colleges and university, enterprises and governmental bodies.

By the end of 2008, China has organized 226 National Training Courses for CP Auditors, with over 12000 trainees obtaining the certification. All these people are quite active in the CP area of China, and play a key role in CP promotion.

In the meantime, the local governments also organize some local training courses for CP auditors for the purpose of providing CP consulting to the local enterprises.

Governmental Officer Training

China also organizes special trainings for governmental officers to raise their capability in promoting and regulation CP. The training mainly covers the regulations, policies, basic concepts of CP and the latest development of CP in China, etc.

Propaganda and Dissemination to the Public

In addition to the above three types of training, China also launches various

propaganda and dissemination initiatives for different target groups. For instances, when the Law was coming into effect in 2003, NDRC organized a lot of campaigns to publicize CP nationwide. During the CP audit, the propaganda towards the high-level management and operators is much more important. These make over 100 thousands of people learn the importance and benefits of CP.

In on word, after nearly two decades of development and practices, China has established a multi-level and multi-type education and training system.

5. Existing Issues and Counter Measures Recommended

Even though China has formed its regulatory system, administrative system, technical supporting system and educational system for promoting CP, with clear Chinese characteristics, there still encounter some issues in the further promotion of CP in China. Great attention should be attached to these issues, so as to ensure the smooth promotion and deepening of CP in China.

The Encouraging Mechanism to be Established and Improved

The funding and encouraging mechanism for promoting CP has to be established and improved in China. The Nation should establish a system of commendation and reward for CP. The people's governments shall give commendations and rewards to those units and individuals that have made conspicuous achievements in the work of CP.

Corresponding funds should be supplied to researches, demonstration and training on CP, and especially to the technological innovation on CP. With respect to products produced from wastes and materials reclaimed from wastes, the taxation authorities should reduce or exempt these from Value-Added Tax in accordance with relevant national regulations.

Research, Development and Dissemination of CP Technologies to be Strengthened

At present, the research and development of CP technologies has less relation with CP audits. As we know, CP audit is a scientific and systematic tool to analyze the whole production process of an enterprise in all rounds, which can identify the key points of pollutants generated. Therefore, the technology-oriented options generated from CP audit has strong practical basis to be used and disseminated. If there is no appropriated and mature technology available, a research and development of such a CP technology is in need. So the research and development of CP technology based on CP audit should be strengthened in the future.

The Environmental Information Disclosure of Key Polluting Enterprises to be Enhanced

The CP Promotion Law requires all the enterprises in the list of key heavily polluting enterprises disclose the emission situation of major pollutants to the public. So the environmental information disclosure of these enterprises should be enhanced.

Chinese practices in CP over two decades prove that the advanced CP concept proposed by the developed countries can be also successfully applied to the developing countries. The question is how to put the great differences in their background and development status into consideration. It needs the developing

countries like China to make much more efforts in researches and practices to adapt CP and find a cleaner development road eventually.

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