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UNIDO Contract No.: 04/128

UNIDO Project No.: EG/CPR/99/G31

P.O. No.: 16000684

Final Report

To

The United Nations Industrial Development Organization (UNIOD)

Contract Title

Establishment and Capacity Building of County-Level Policy Implementation Committees-Phase II

Project Title

Energy Conservation and Greenhouse Gas Emissions Reduction in Chinese Township & Village Enterprises-Phase II

by

MOA Township Enterprise Development Center (TEDC)

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Contents

This is the final report on Establishment and Capacity Building of County-Level Policy Implementation Committees under EG/CPR/99/G31, in which records all the activities carried out and achievements made from June 1, 2004 to June 15, 2005. It is submitted by MOA Township Enterprises Development Center (TEDC) and MOA Technical Development Center of Energy & Environmental Protection (hereinafter referred to as "subcontractors") to the United Nations Industrial Development Organization (UNIDO). Here is one point to say that though the subcontract was officially signed in September 2004, the implementation started in June 2004 under the suggestion and requirement of PMO, PIC and former CTA.

Content is as follows:

1. Information Collection and Discussion

Based on the information collected in LPIC I , the subcontractors collected new materials about environmental protection and energy efficiency in China. To collect rules and regulations and industrial criteria at these aspects, and to clear the international and national energy supply status, national energy conservation and environmental protection policies, and TVE development policies, visits were paid to National Development and Reform Commission (NDRC), Ministry of Science and Technology, State Environmental Protection Administration, China Building Materials Administration, Renovation Office of Roof & Wall Materials, China Energy Association, China Environmental Protection Association and Building Materials Association. Then, the subcontractors discussed achieved outputs such as three sector surveys, Shanxi coking sector survey and reports on establishment and capacity building of LPICs-Phase I , and found materials about different sectors and pilot TVEs through national library and internet. A workshop was organized on June 4, 2004 with PMO, PIC Secretariat and Hongyuan Company to analyze barriers and problems up against the subcontract implementation and debrief ideas and suggestions on capacity building of LPICs- Phase II .

2. Summary and Analysis of Lessons Learned From LPIC I

To complete tasks required in the subcontract of LPIC II , three workshops were held respectively on May 18, May 31 and June 1, 2004, to summarize and analyze achievements and experiences of LPIC I . PMO, PIC Secretariat, Hongyuan Company and related sector experts participated in the workshops, and studied work approaches, contents, models, procedures, results and operations in Phase I. All participants agreed on the values in innovation and demonstration of the three new LPIC models, VA operation system and the calculation methods of energy saving specially designed for Chinese TVEs as well as for Small- and medium-sized enterprises, which is worth of disseminating widely.

2.1 Three new LPIC models

- **LPICs emphasizing local characters:** According to the TOR, LPICs

established in Phase I had to rely on TVE administrative units, which was effective and adaptive to China's situation of that time. During the SC implementation, the subcontractors found that reformation of ownership and property relation in TVEs almost finished with the progress of governmental reform and institutional restructuring. Diversified settings and functions of local governments replaced the previously uniform one. But as the central government pay more attention on energy saving work, the willingness and activeness of local governments and TVEs were increased rather than decreased. Thus, we suggest establishing LPICs that can emphasize local characters in Phase II, by setting TVE's energy conservation and GHG emissions reduction as an objective, adopting flexible means, and taking institutional capacity and feature of local governments into consideration.

- **LPICs commissioned by industrial associations:** Industrial associations, whose growth is a result of reform in governmental management style (from micro-management to macro-management; from command to service), not only supervise certain industrial enterprises but also take responsibility by government entrustment in some administrative management. It is suggested that establishment of LPICs in Phase II consider the important role of industrial associations in enterprise management, and take advantages of the associations, especially those with excellent performances in pilot projects and strong willingness in energy efficiency and GHG emissions reduction. LPICs can be commissioned by industrial associations at request.

- **LPICs with updated concept:** Due to great adjustments in national industrial policies, essential changes happened to some industrial technology and equipment in TVEs, including average scale enlarged, equipment and facility upgraded, and the number of enterprises decreased. It makes identification of pilot regions at county level harder. The subcontractors need to think about how to upgrade the pilot regions' level and how to bring multi-typed TVEs into the project, in order to replicate project results. It is suggested breaking through the county-level concept by shifting attentions to actual industrial situations such as TVE size and location and establishing LPICs at county/city/provincial level timely.

2.2 Operation system of VA created for Chinese TVEs and SMEs

- **VA is a new tool in energy conservation and GHG emissions reduction currently used by large enterprises in developed countries, not adopted by TVEs and SMEs in developing countries.** It is the beginning phase of introducing this tool into a developing country—China and Chinese TVEs. Believing in "learning by doing", the subcontractors developed an operation system for Chinese TVEs and SMEs after 9-month-practice of using VA:
  - ☆ Establishing a LPIC
  - ☆ Assisting TVEs in setting down energy saving plans
  - ☆ TVEs adopting the economic assessment on EE technology
  - ☆ TVEs adopting the environmental protection assessment on EE technology
  - ☆ Facilitating VA drafting and signing
  - ☆ Monitoring Assessment

This system wins agreement and approval from LPICs and pilot TVEs, as well as PMO, former CTA, and PIC Secretariat.

- **Methods to monitor and evaluate energy savings are created for Chinese TVEs and SMEs.**

EEI, which is designed for large enterprises in developed countries like Netherlands, cannot be used in Chinese TVEs and SMEs for the following reasons:

- ☆ No enterprises like Chinese TVEs in Netherlands, i.e. no counter-parts for reference;
- ☆ Characters of Chinese TVEs--small scale, dispersed, large number and low quality in technology and management.

The SC experts reckoned that though backgrounds and current situations of enterprises at home and abroad are different, their purpose on VA utilization are same, i.e. to save energy. That is, either developed countries or developing ones want to promote enterprises to save energy and reduce CO_2 emissions, thereby to reduce costs, enhance competitive abilities and improve social/environmental images of the enterprises.

Thus, the experts created new calculation methods to monitor and evaluate energy savings for Chinese TVEs and SMEs. Based on realities of Chinese TVEs, a thorough comparative study and Netherlandish VA experts' help, these methods were successfully used in cement, foundry, brick making and coking sectors, accepted and praised by pilot TVEs.

Notes:

Dian, a VA expert from Netherlands, didn't understand and agree on the new calculation methods of EE coefficient at the very beginning. After a number of discussions, an agreement was eventually made between Dian and the SC expert team.

3. Writing and Submitting Inception Report of LPIC II

As required in the contract and TOR of LPIC II, the subcontractors (We) wrote the inception report on the basis of experiences and lessons learned from LPIC I, to present understandings about the project objectives and main tasks, illuminate the implementation periods & areas & sectors, explain the difference between Phase I and Phase II, and point out some emphasis. We also developed a detailed implementation program as an important part of the report (see Annex 11.1). The inception report was submitted to UNIDO on Aug. 10, 2004.

4. Establishment and Official Confirmation of LPICs

Upon inception of this subcontract on Sep1, 2004, the subcontractors assisted PIC in communicating with local governments of relevant demonstration regions. Discussions about LPIC characters, compositions, responsibilities, working procedures and specific locations were held in the forms of workshops and visits, combining with field surveys, between local governments and the subcontractors. By Oct. 2004, four LPICs had been established with the official confirmation.

Notes:

After summing up the finished establishment and capacity building of LPIC I, new models of LPICs were proposed and gained agreements from PMO and PIC before the implementation of LPIC II. Under these circumstances, an upgraded LPIC was established in Shanxi Province.

- **Background:** According to the TOR of LPIC II, Qingxu County in Shanxi Province was identified as a demonstration region in coking sub-sector.

- Through surveys and investigations, the subcontractors found that: Shanxi is one of the most important provinces in China's coking industry, with an annual output of more than 60 million tons of coke. The coking industry is the dominant industry in Shanxi. But the execution of national industrial policies has greatly influenced Shanxi's coking industry in recent years. Great changes have taken place to technical restructuring in coking industry. Local and improved local ovens and small-scale mechanical ovens with underdeveloped technologies have been eliminated, which causes a sharp decrease of TVE number in coking sub-sector. In the meantime, some major coking companies are enlarging their projects of large-scale mechanical ovens. Researches at provincial level result in representative ovens like QRD-2000 clean oven to be put into production, bringing new opportunities for EE replication and TVEs development.
- As the "clean type coke oven" is a brand-new technology with few users in the whole province of Shanxi, it is not effective enough to set up an LPIC at county level as originally planned in the TOR. Therefore, the subcontractors proposed to establish this LPIC at provincial level, relied on Shanxi TVE Bureau (which is also called Shanxi SME Bureau).

- **Reasons for success**

  This proposal is consistent with EE work plan in Shanxi provincial government.

- **Local government attached importance to energy conservation.** Shanxi provincial government stuck great significance into this project. The vise nomarch said many times that: It is important to accomplish this project by combining the industrial restructuring with LPIC's work. Under guidance of

PMO and PIC, we would create a good circumstance for this new LPIC.

- **Shanxi TVE bureau showed positive attitudes to the project.** A deputy director general of Shanxi TVE Bureau engaged in TVE management for more than 20 years was dispatched to assist this project, which ensured the establishment and capacity building of the upgraded LPIC.

➢ **Evaluation**

After eight-month operation, it is agreed by PMO and PIC that the new-model LPIC is worth of demonstration and replication. Shanxi provincial government speaks highly of the win-win effects on promoting EE technical renovation and GHG emissions reduction in coking industry of Shanxi, as well as the project progress.

5. Field Surveys and Investigations

- Developed field survey programs, communicated with local governments, solicited their ideas and suggestions, and coordinated with them to make preparations;
- Held a preparation meeting including all members of the survey group before the departure from Beijing, in accordance with the survey programs and suggestions from local governments;
- Invited representatives of PMO, PIC and Hongyuan Co. to investigate Baqiao Brick Plants (Xi'an, Shaaxi Province), Fangshan Brick Plant (Beijing), Shanxi Coke Companies, Tongxiang Cement Companies (Zhejiang Province) and Baojiang Cement Company (Yingde City, Guangdong Province) respectively on June 14-17, July 1-2, Aug 19-22, Sep 6-9 and Oct 21-24, 2004;
- Field surveys carried out through visiting, meeting, discussing and investigating; the SC experts from legal, environmental policy, energy efficiency and industrial sectors;
- Situations of the TVEs concerned and policy barriers on adopting EE technology clarified, information about the TVEs development and service needs collected; which provide valuable references to development of replication plans;

- An important achievement: LPICs' membership, framework and functions fixed under the guidance of SC experts and representatives from PMO and PIC Secretariat based on the obtained information, which made the clearance of LPIC establishment and statute & Action Plan development.

Notes:

Whereas its equipment indraught confronted big problems, its key task at the moment is to solve those problems, and it is unable to continue the project implementation as required, the Yancun Brick Plant (Fangshan, Beijing) applied to unburden the assignment of capacity building as one pilot TVE and Fangshan District, Beijing applied to stop capacity building as one demonstration region. PMO accepted their applications. At this news, subcontractors immediately exchanged their opinions with PMO and PIC Secretariat, they agreed on suspension of LPIC capacity building in Fangshan District, Beijing. Thus, here is no survey material about that District. Then PMO and PIC Secretariat informed subcontractors that Yingde County (Guangdong Province) would establish an LPIC and Xinggao Coke Company would sign a VA during the LPIC capacity building-Phase II, and the subcontractors accepted these two tasks.

6. Drafting and Revising and Conducting *Survey Reports*, *Statutes*, *Action Plans*, and *Voluntary Agreements*

- Based on the obtained information, SC experts drafted four survey reports (draft), assisted Tongxiang, Baqiao (Xi'an), Yingde (Guangdong) and Shanxi LPICs in writing statutes (draft) and Action Plans (draft), and developed VAs for related TVEs;
- Four workshops held in PMO (Beijing) respectively on July 9, Sep 28, Oct 25, Dec 18 to discuss the draft survey reports, whereafter the drafter revised the reports according to comments from SC experts, PMO, PIC and former CTA;
- The above-mentioned reports sent to LPICs to solicit their comments and suggestions, and amended in accordance with the feedbacks. (See Annex 11.2. 11.3, 11.4, 11.5.)

Notes:

The EE technical innovation program of Lufeng Cement Company (Hubei Province) was finalized. We amended the original VA and Action Plan accordingly and facilitated the local government to sign a VA with the company. (See Annex 11.6)

7. Training

7.1 Preparations

Under the direction of PMO and PIC Secretariat, the training sessions were organized on the following day of PIC Annual Meeting with strong supports from PMO, PIC Secretariat and Hongyuan Co., so as to avoid short-term repeated activities, better work plans of LPICs and TVEs, and have more relative persons trained within the limited SC expense. Details were as follows:

- Survey on training needs through telephone, e-mails and field surveys;
- Workshop on training content, objectives and composition of trainees with PMO, PIC Secretariat and Hongyuan Co., according to the needs of newly established pilot counties and TVEs; development of the training program complied with the feedbacks;
- Organizing experts to compile training materials, reviewing them with PIC Secretariat, and giving revising advice;
- Assisting PMO in releasing training notice, and inviting officials and TVE representatives in pilot and replication counties to attend the sessions as required by PMO and PIC Secretariat.

7.2 Training sessions

- Successfully organized in Beijing Fragrant Hill Hotel on Sep 23- 25, 2004 (PIC Annual Meeting held on Sep 21-22, 2004), 38 persons trained;
- Patterns: lectures and discussions; training on the first two days while experience exchange on capacity building of LPICs on the third day.
- Results
  - Made the implementation strategy and approach further understood;
  - Let government officials and TVE representatives in another four

demonstration regions, especially representatives from replication regions, know the objectives, significance, framework and procedures of establishment and capacity building of LPICs;

- Exchanged experience in capacity building of LPICs and the implementation status of pilot TVEs, which provided valuable *information for reference*;
- Enriched participants' knowledge on environmental and energy saving policies and recurrent economies, and knew new financing channels such as the energy management contract.
- Clarified tasks and requirements in different regions and TVEs.

8. Assisting PIC and Hongyuan Co. in Monitoring and Evaluating the Implementation and VA of LPIC I

As required in the contract, the subcontractors should assist PIC and Hongyuan Co. in monitoring and evaluating the implementation of VA and capacity building of LPIC I.

- Assisted HY Company in holding a meeting for the expert team on Oct 18, 2005. Ms Wang Guiling, Deputy Director of the PMO, and Mr. Wang Xiwu, Senior Administrator of the PIC Secretariat were specially invited. It was decided at the meeting to speed up a document, and dispatch it under the name of the PMO to ask LPICs to strengthen the leadership, summarize their work and carefully draft their *LPIC Annual Report* and *Annual VA Monitoring Report of Pilot TVEs,* thereby to make good preparations for the project review.

- Assisted Hongyuan Co. in sending the above-mentioned document via e-mails to three LPICs established in Phase Ⅰ on Dec 21, 2004 and asked them to submit relevant reports to the subcontractors, PMO, PIC Secretariat and Hongyuan Company by Mar 20, 2005. During this period, the subcontractors conducted coordination with LPICs for several times, and got their *LPIC Annual Report* and *Annual VA Monitoring Report of Pilot TVEs* correspondingly in time.

- Assisted Hongyuan Co. in conducting a comprehensive review on the operation of the three LIPCs established in Phase I and their implementation of VA on Mar 30, 2005, to make preparations for the mid-term evaluation in May 2005. A report was developed and finalized after consulting with the PMO and PIC Secretariat in this regard.

9. Facilitating VA Signing

On Feb19, 2005, after getting approval from the PMO and PIC Secretariat, the subcontractors contacted LPICs respectively in Tongxiang (Zhejiang Province), Baqiao (Xi'an, Shaanxi Province), Shanxi Province, Yingde (Guangdong Province), and Huangshi (Hubei Province) and related pilot TVEs, discussed VA signing matters, and formally sent VAs to the four LPICs via express mail for their signature. Copies of the co-signed VAs were submitted to the PMO, PIC and Hongyuan Co.

10. Conclusions and Suggestions

➢ Conclusions

During the 8-month SC implementation, the subcontractors (We) accomplished all tasks required in the subcontract of LPIC II, in particular the successful establishment of four new LIPCs in addition to the four LPICs established in Phase I. We assisted the new LPICs in developing their own Statutes, Action Plans and VAs, and facilitated the VA signing. Moreover, we conducted the monitoring and evaluation on implementation of VA and capacity building of LPIC I, and modified and improved the system of VA monitoring and evaluation. Finally, we drafted this final report to review the project progress and summarize results achieved. In this report, we also presented suggestions regarding the establishment and capacity building of LPICs (see Annex11.8 in detail) after discussing with PMO and PIC.

➢ Suggestions

Based on our implementation of the SC and the consultation with the PMO and PIC Secretariat, the subcontractors would like to present suggestions as below.

- During the SC implementation, it is crucial for the subcontractors to work closely with the PMO and PIC Secretariat and get their guidance and advice in time. This is the most important pre-condition and assurance for the success of the SC.
- Keep in touch with LPICs and pilot TVEs, follow up the project progress closely, and solve problems in time when and where they occur.
- Fully draw lessons from the implementation of LPIC I in the project replication. When establishing an LPIC, the three innovative models developed by the subcontractors could be used on basis of the practical situation.
- When developing an Action Plan, it is crucial to combine it with local mid-long term work plan and development strategy and to make its implementation in line with local governmental advocation, thereby making the Plan interact with local programs.
- Strengthen commutations with other subcontractors in this project or with other similar projects to draw lessons and experiences with each other and enlarge horizon on project implementation.

Annex 11.1:

United Nations Industrial Development Organization

ENERGY CONSERVATION AND GREENHOUSE GAS EMISSIONS REDUCTION IN CHINESE TOWNSHIP & VILLAGE ENTERPRISES–PHASE II

Inception Report

for

Establishment and Capacity Building of Local Policy Implementation Committees—Phase 2

R. F. P. No.: P. 2004-071

Project No.: EG/CPR/99/G31

Submitted by

MOA Township Enterprise Development Center (TEDC)

And

MOA Center for Development of Energy & Environmental Protection Technology (EEPTDC)

August 2004

Contents

1. General introduction

1.1 Objectives

According to the requirement of national PTPMC and the Phase II subcontract, the capacity building of Phase I LPIC in the four demonstration counties during is to be examined and evaluated. In implementing Phase II subcontract, the achievements and experiences gained in Phase I shall be absorbed in order to establish LPIC in the four new demonstration areas and strengthen their capacity building. These efforts shall help these areas to conduct energy efficiency and pollution reduction, to remove the policy, technical and financial barriers and to promote local sustainable development.

1.2 Tasks

In implementing the Phase II subcontract, the fruits achieved in Phase I shall be integrated in order to promote the smooth implementation of Phase II subcontract. The major tasks of the project are as follows:

First, the project shall overview how well LPICs and demonstration enterprises have implemented Action Plans and Energy Efficiency Voluntary Agreements, and evaluate the feasibility and suitability of Monitoring Evaluation Systems related respectively to Action Plans and Energy Efficiency Voluntary Agreements.

Second, establish LPIC in the four new demonstration areas and strengthen their capacity building and the major tasks include formulating Action Plans and Energy Efficiency Voluntary Agreements and the two relevant Evaluation Systems.

Third, conduct industrial survey. The field study in the four demonstration areas is the most important task among the whole subcontract activities. The project staff shall communicate with related TVEs' managers and learn the obstacles to their energy efficiency and environment protection activities, the managers' expectation for the government, their willingness to adopt energy efficiency technologies and the way to raise fund for technical upgrading. LPIC members shall be approached in order to learn the present administrative policies formulated and issued by government agencies and the fulfillment and effects of these policies, the government agencies' willingness to participate in the project and the possible support (policy, financial and technical support) they shall grant for TVEs' energy efficiency activities. The information that shall be gathered from the above-mentioned sources shall be analyzed and it will enable the subcontractor to help LPIC promote local energy efficiency and environment protection work and formulate feasible and practical Working Rules, Action Plans and Energy Efficiency Voluntary Agreements.

1.3 Project term and project areas

The project term is 8 months, from June 2004 to January 2005. The project shall conduct follow-up activities in the Phase I demonstration counties and launch new activities in the four new demonstration regions: Tongxian county of Zhejiang province, Baqiao district, Xi'an city of Shaan'xi province, Fangshan district of Beijing city and some areas in Shanxi province. In every selected region, a typical enterprise and the industry to which the enterprise belongs shall participate in the demonstration activities. The industries selected by the project are cement industry in

Tongxian County, brick industry in Baqiao district and Fangshan district and coking industry in Shanxi province.

1.4 Differences between Phase I and Phase II subcontracts

- Based on the fruits achieved in Phase I, the Phase II subcontract shall deepen its contents. Phase II subcontract shall not mechanically repeat what have been done in Phase I and the working philosophy and procedures of Phase I shall be reviewed. LPIC's organizational structure, its operation way, Energy Efficiency Voluntary Agreement, Action Plans, survey contents and methods shall all be revised and improved. The implementation of Phase II subcontract is a testing, supplementation and improvement of Phase I subcontract.
- There are some differences between phase I and phase II demonstration areas. The four demonstration areas in phase II were successively specified from June 2002 to May 2003. As newcomers, they have quite limited understanding and knowledge of the project and their basic preparation for the project is inadequate. The four phase II demonstration counties, however, were specified in 1997 and they had participated in many project activities. They have been quite familiar with project requirements and its operation procedures. Therefore, the experts and staff working for the phase II subcontract should be ready to offer timely, patient and detailed advices for the demonstration areas and for relevant TVE enterprises.

1.5 Problems needed to be addressed in project implementation

- In phase I , all the four LPICs have been backed and supported by local TVE administrations. With deepening reform, the administrative agencies in China shall be profoundly restructured. The setup and functions of TVE administrations shall vary greatly from one place to another. In phase II , the LPICs' backing and supporting administrations shall be decided according to the local realities. The capacity of the administrative agencies and the willingness of local government shall be taken into consideration. LPICs with regional characteristics shall be established to help TVEs conduct energy efficiency and GHG emission reduction activities.
- As government administration style changes from micro to macro affairs and from commanding to serving, various industrial associations emerge as the times require. Besides managing their own industries, these associations have been entrusted by government to assume certain administrative functions. They shall play an increasingly important role in industrial management and operations. Therefore, it is worth trying for LPICs to be backed and supported by industrial associations.
- At present, China has restructured its industrial policies. As a result, the technical and equipment compositions of some TVEs have changed drastically. The average scale of the enterprises has become bigger, the equipment level has been enhanced and the number of TVEs has become smaller. The construction of demonstration areas in these regions should consider enhancing the demonstration TVEs' technical and equipment level, so that more enterprises can be covered by the project.

- The formulation of feasible and practical Action Plans is one of the most important contents in LPIC capacity building. The Action Plans formulated in four new demonstration areas shall fit into local government's long, medium and short-term working plans and strategies and bring out the best in each other.
- Strengthen information exchanges and communication and share the project achievements. These efforts shall broaden the project stakeholders' perspective. Close communication with LPICs and demonstration enterprises shall help PMO and CTA to be informed of the project progress and promptly find problems and solutions.
- Environment policy experts play an important role in project implementation process. Their expertise provides strong technical supports for LPICs' work, for the formulation of Energy Efficiency Voluntary Agreements, Action Plans and Monitoring and Evaluation Systems.

1.6 Notes on the establishment of LPIC in Shanxi Province

According to phase II bidding requirement, the subcontractor has proposes that coking TVEs in Qingxu County of Shanxi province is to be demonstrated for LPIC capacity building. According to the information gathered by PIC and CTA, China's industrial policy changes have had great effect upon the coking industry in Shanxi Province. The technical structure of the TVE coking industry has changed a lot, many locally made or improved coking ovens and some technically backward small-engine ovens have been closed and the number of the coking TVEs has been drastically reduced. The leading coking TVEs have begun to improve and expand the use of large-engine ovens. In the whole province, new types of ovens that suit to local realities and demands have been researched and developed. The clean and heat-recycling ovens, as QRD-2000 the typical type, have been developed and put into production. All these efforts have brought new opportunities for local coking industry development and for energy efficiency and pollution reduction. The number of coking TVEs in Qingxu County is quite small and some of them are now in the process rebuilding and expanding. This fact is not favorable for project implementation. Shanxi province is the major coke producer and the annual coke output reaches more than 60 million tons. Coking is one of the major industries in Shanxi province. The coking enterprises are quite active and well-informed. The establishment of provincial LPIC will effect a breakthrough of the concept of LPIC. It shall be a new try and promote the overall advance of the project. LPIC's capacity shall be built and its working philosophy be integrated into the provincial industrial restructuring. This shall promote local coking industry's technical advance and its energy efficiency and GHG emission reduction and the win-win ideal shall be realized.

2. Working plan

2.1 Task 1: Proposal report conference

Time: the first week

Locale: Beijing

Participants: Members from PMO and PIC, CTA, representatives from

Hongyuan Company, expert team members that stay in Beijing

Objective: define the goals of the subcontract, specify working methods and task division, work out schedule and discuss relevant questions

Working procedure:

- The subcontractor carefully prepares conference materials and decides the conference locale.
- Organize participants to discuss; record the speech and statement made by participants.
- Revise the proposal according to the participants' comments and suggestions;
- Submit the revised proposal to PMO and CTA.

2.2 Task 2: Evaluate the results of the implementation of Action Plans and Energy Efficiency Voluntary Agreements by the four LPIC in Phase I

Time: the fist week to the 28th week

Persons in charge: Wang Hui, Yao Xiangjun, Tang Min, Zhou Hong, Tian Yishui, Cao Fengzhong, Meng Zhaili

Working procedure:

- Keep contact with four LPICs and with demonstration enterprises. Contact them by telephone or email at least once per quarter in order to learn the project progress, problems and the causes, whether the problem solved, to be solved or unsolved and report the information gathered to PMO, PIC and CTA.
- Invited by local stakeholders and approved by PMO, the subcontractor shall participant in the major activities held by LPICs and the demonstration enterprises.
- Draft *Notice on Launching Evaluation of Action Plans and Energy Efficiency Voluntary Agreements*;
- Supervise and urge LPICs and demonstration enterprises to write the annual working report.
- Participate in annual assessment.
- Write evaluation reports on the implementation of four Action Plans and Energy Efficiency Voluntary Agreements

2.3 Task 3: Summarize the experiences accumulated by the phase I LPICs and revise Action Plans and Energy Efficiency Voluntary Agreements

Time: the first week to the twelfth week

Persons in charge: Wang Hui, Yao Xiangjun, Tang Min, Zhou Hong, Tian Yishui,

Cao Fengzhong, Meng Zhaili

Working procedure:

- Draft experiences summery report.
- Conduct a workshop and invite experts to exchange their comments and suggestions on the three subject reports.
- Collect the progress of the four phase I LPICs and demonstration enterprises as well as comments and suggestions from LPIC members and from TVEs managers.
- Revise and enrich the experiences summery reports.

2.4 Task 4: Establish phase II LPICs in four demonstration areas

Time: the first week to the ninth week

Persons in charge: Wang Hui, Cao Fengzhong, Zhou Hong

Working procedure:

- Introduce phase I LPICs and their advantages and disadvantages to local governments or agencies designated by local government, and learn local governments' willingness and the working obstacles.
- Collect information and organize a workshop to discuss the four LPIC model. People from PMO, PIC and CTA shall participate in the workshop.
- According to the project requirement and local realities, the subcontractor shall assist relevant government agencies to establish LPIC. LPIC members should include government officials in charge of industrial production and people from TVE administration, environment administration and industrial policy supervision administrations, etc.
- Help to specify LPIC's working body and working locale.
- Help to prepare related documents and materials.
- Draft LPIC's working rules.

2.5 Task 5: Conduct industrial survey

Time: the first week to the 15th week

Persons in charge: Yao Xiangjun, Zhou Hong, Tian Yishui, Cao Fengzhong, Meng Zhaoli

The contents of the survey:

- Local industrial development status, including local TVEs' basic state, technical equipment level of the related industries, energy consumption and pollution discharge level, industrial management and local TVEs' internal management.
- Local TVEs' property right reform, including the property right structure of all the TVEs in the whole region, the reform trend, local policies that promote TVEs property right reform and their sustainable development, the positive and

negative effects of these policies on the development of TVEs, especially effects on local TVEs' voluntary activities for energy efficiency and environment protection.

- Local laws, regulations and policies that promote industrial technical advance, energy efficiency and environment protection. The laws and regulations shall be gathered and their fulfillment status and their effects on promoting local social and economic development shall be studied.
- The mechanism by which local TVEs obtain advanced technologies. Based on the above-mentioned survey results, the barriers that are against local TVEs' adopting advanced energy efficiency technologies shall be identified. According to local realities, the measures to remove these obstacles shall be put forward.

Working procedure:

- Study the Survey Reports and gather information on related industries, demonstration regions and enterprises;
- Formulate survey plan;
- Survey the construction of LPICs in the four demonstration regions;
- Write survey reports.

2.6 Task 6: Formulate action plan

Time: the second week to the 11th week

Persons in charge: Cao Fengzhong, Zhou Hong

Working procedure:

- Survey the policy obstacles to TVEs' adopting energy efficiency technologies in demonstration regions;
- Survey local TVEs' property right reform status and policies and measures that promote TVEs' transition to market mechanism and their sustainable development;
- Survey local laws, regulations and policies that promote local TVEs' technical upgrading, energy efficiency and environment protection as well as the fulfillment status of these laws and regulations;
- Survey the barriers that are against local TVEs' adopting advanced energy efficiency technologies;
- Based on the above-mentioned survey results and conclusions, the suggestions shall be put forward and action plan be formulated to remove these policy obstacles;
- Solicit comments and suggestions and revise the action plan according to the feedbacks

2.7 Task7: Draft and sign Voluntary Agreement

Time: the second week to the 11th week

Persons in charge: Yao Xiangjun, Meng Zhaoli, and Tian Yishui

Working procedure:

- Study the energy efficiency technical upgrading plans submitted by four demonstration enterprises.
- According to the survey results, help demonstration enterprises to assess their energy efficiency potentialities and provide information on energy efficiency technologies.
- Assist PIC and four LPICs to formulate preferential policies and incentive and punishment measures in order to fulfill the enterprises' energy efficiency objectives.
- Draft Voluntary Agreement
- Solicit comments and suggestions from PMO, CTA, PIC, demonstration regions and enterprises and revise the Voluntary Agreements accordingly.
- Coordinate enterprises and government (or industrial association) to sign Voluntary Agreements.

2.8 Task 8: Revise the Assessment Systems for Action Plan and Energy Efficiency Voluntary Agreement

Time: the 12th week to the 30th week

Persons in charge: Wang Hui, Yao Xiangjun, Tang Min, Zhou Hong, Cao Fengzhong, Meng Zhaoli, Tian Yishui

Working procedure:

- Summarize the assessment work conducted in the four phase I demonstration counties, discuss the problems identified during practical operation in the two systems and work out solutions to these problems;
- Revise the two Assessment Systems.
- The subcontractor shall conduct the above-mentioned two activities together with PMO, PIC, CTA and Hongyuan Company.

2.9 Task 9: Training

Time: the forth week to the 11th week

Locale: Beijing

Persons in charge: Wang Hui, Yao Xiangjun, Tang Min, Zhou Hong, Cao Fengzhong, Meng Zhaoli, Tian Yishui

Training contents:

The training shall be held when the surveys in the four demonstration areas are finished and the survey reports, Energy Efficiency Voluntary Agreements, Action Plans and Working Rules are formulated. During the training period, environment policies and energy efficiency experiences accumulated by the international

community shall be presented to the trainees. The formulated documents shall be fully discussed. The representatives from eight demonstration areas and enterprises shall share their experiences in the field of LPIC establishment, its roles and operation practices. The information exchanges shall be both inspiring and helpful to all the stakeholders and make the training successful.

Working procedure:

- Design detailed training plan, including settling upon training contents, trainers and trainees;
- Discuss training plan with PMO, PIC and CTA;
- Prepare for the training, including drafting training manual, employing trainers, issuing notice, notifying trainees and settling training venue;
- Carry out the training.

2.10 Task 10: Complete working plan

Time: the 13th to the 32nd week

Persons in charge: Wang Hui and Tang Min

Working procedure:

- Draft the interim reports.
- Submit the reports to PMO, PIC and CTA for comments;
- Revise the interim reports according to the comments and suggestions from PMO, PIC and CTA.
- Submit the interim reports to UNIDO.
- Draft the final reports.
- Submit the reports to PMO, PIC and CTA for comments.
- Revise the final reports.
- Submit the interim reports to UNIDO.

3. Survey plan

3.1 Survey objectives

The objective of the survey is to help the demonstration counties' government formulate LPIC's Working Rules and Action Plans, help the demonstration counties and TVEs to work out practical Energy Efficiency Voluntary Agreement. These efforts shall contribute to TVEs' sustainable development, promote the supervision system reform for environment protection laws and regulations and remove the obstacles to their adopting energy efficiency technologies.

3.2 Survey methods

Workshops shall be held to learn the macro-situations and then fields studies be conducted in demonstration TVEs.

3.3 Survey time and locale

The second week to the third week, Baqiao district, Xi'an city, Shaan'xi province

The forth week to the fifth week, Fangshan district, Beijing

The sixth week to the seventh week, Tongxiang County, Zhejiang province

The ninth week to the tenth week, Qingxu County, Shanxi province

3.4 Survey members

Subcontractor, Expert Team members, industrial experts, CTA, staff from PMO and PIC.

3.5 Survey contents

3.5.1 Survey the energy efficiency demonstration progress in TVEs in Baqiao district or even in Xi'an city, Shaanxi province. Specifically, the survey shall cover the basic status of the brick making, cement, coking and casting industries in Baqiao district, the development plan, related industrial policies and the fulfillment of these policies.

- Coordinate possible members from LPIC of Baqiao district, industrial experts and local government officials to discuss the preparation of LPIC, its nature, mission, organization, duties and working procedures, and discuss the fulfillment of energy efficiency and environment policies in Baqiao district and urge local government to confirm LPIC with government papers.

- Discuss the adopting of energy efficiency technologies among brick-making TVEs in Xi'an city, the related problems and TVEs' willingness

  Convene managers from brick-making TVEs in Baqiao district, LPIC members, people from Xi'an Wall Materials Association and industrial experts to participate in the workshop. Discuss local TVEs property reform and their performances, identify the market, willingness, financial, technical and policy obstacles to their adopting energy efficiency technologies; discuss the policies related to wall materials reform, the TVEs' willingness and the obstacles they are faced with and the suggestions they offer to administrative officials.

- Survey energy efficiency technical upgrading plan and strategy formulated by TVEs in Baqiao district

  Conduct field study and on-the-spot workshop. PMO, PIC, CTA, subcontract expert group members, LPIC representatives, local policy experts shall conduct field study of Liucun Brick Factory's assembly line, productivity, technical upgrading. An on-the-spot workshop shall be held to discuss the energy efficiency technical upgrading plan and confirm the framework of Energy Efficiency Voluntary Agreement items.

- Discuss the wall materials reform in Xi'an city

  Learn the reform status of local wall materials and the fulfillment of related policies.

3.5.2 Survey energy efficiency demonstration construction in TVEs in Fangshan district, Beijing city, and survey the basic status of the TVEs including brick-making industry in Fangshan district, the development plans, related industrial policies and the fulfillment of these policies.

- Coordinate possible members from LPIC of Fangshan district, industrial experts and local government officials to discuss the preparation of LPIC, its nature, mission, organization, duties and working procedures, and discuss the fulfillment of energy efficiency and environment policies in Fangshan district and urge local government to confirm LPIC with government papers.

- Convene managers from brick-making TVEs in Fangshan district, LPIC members, people from Beijing Wall Materials Association and industrial experts to participate in the workshop. Discuss local TVEs property reform and their performances, identify the market, willingness, financial, technical and policy obstacles to their adopting energy efficiency technologies; discuss the policies related to wall materials reform, the TVEs' willingness and the obstacles they are faced with and the suggestions they offer to administrative officials.

- Survey energy efficiency technical upgrading plan formulated by TVEs in Fangshan district

  Conduct field study and on-the-spot workshop. PMO, PIC, CTA, subcontract expert group members, LPIC representatives, local policy experts shall conduct field study of Yancun Brick Factory's assembly line, productivity, technical upgrading. An on-the-spot workshop shall be held to discuss the energy efficiency technical upgrading plan and confirm the framework of Energy Efficiency Voluntary Agreement items.

- Survey the wall materials reform in Beijing city and learn the reform status of local wall materials and the fulfillment of related policies.

3.5.3 Survey energy efficiency demonstration construction in TVEs in Tongxiang county, Zhejiang province, and the basic status of the TVEs including cement and brick-making industries in Tongxiang County, the development plan, related industrial policies and the fulfillment of these policies

- Coordinate possible members from LPIC of Tongxiang county, district, industrial experts and local government officials to discuss the preparation of LPIC, its nature, mission, organization, duties and working procedures, and discuss the fulfillment of energy efficiency and environment policies in Tongxiang County and urge local government to confirm LPIC with government papers.

- Discuss the adopting of energy efficiency technologies among cement TVEs in Tongxiang County, the related problems and local TVEs' willingness

  Convene managers from cement TVEs in Tongxiang County, LPIC members, people from Zhejiang province Wall Materials Association and industrial experts to participate in the workshop. Discuss local TVEs property reform and their performances, identify the market, willingness, financial, technical and policy obstacles to their adopting energy efficiency technologies; discuss the policies related to wall materials reform, the TVEs' willingness and the obstacles they are faced with and the suggestions they offer to administrative officials.

- Survey energy efficiency technical upgrading plan and strategy formulated by TVEs in Tongxiang County

  Conduct field study and on-the-spot workshop. PMO, PIC, CTA, subcontract expert group members, LPIC representatives, local policy experts shall conduct field study of Shenhe Cement Company's assembly line, productivity, technical upgrading. An on-the-spot workshop shall be held to discuss the energy efficiency technical upgrading plan and confirm the framework of Energy Efficiency Voluntary Agreement items.

3.5.4 Survey energy efficiency demonstration construction in TVEs in Shanxi province and the basic status of the coking TVEs, the development plan, related industrial policies and the fulfillment of these policies.

- Coordinate possible members from LPIC of Shanxi province, industrial experts and local government officials to discuss the preparation of LPIC, its nature, mission, organization, duties and working procedures, and discuss the fulfillment of energy efficiency and environment policies in Shanxi province and urge local government to confirm LPIC with government papers.

- Discuss the adopting of energy efficiency technologies among coking TVEs in Shanxi province, the related problems and local TVEs' willingness

  Convene managers from coking TVEs in Shanxi province, LPIC members and industrial experts to participate in the workshop. Discuss local TVEs property reform and their performances, identify the market, willingness, financial, technical and policy obstacles to their adopting energy efficiency technologies; discuss the policies related to wall materials reform, the TVEs' willingness and the obstacles they are faced with and suggestions they offer to administrative officials.

- Survey energy efficiency technical upgrading plan and strategy formulated by coking TVEs in Shanxi province. Conduct field study and on-the-spot workshop. PMO, PIC, CTA, subcontract expert group members, LPIC representatives, local policy experts shall conduct field study of Gangyuan Coking Company's assembly line, productivity, technical upgrading. An on-the-spot workshop shall be held to discuss the energy efficiency technical upgrading plan and confirm the framework of Energy Efficiency Voluntary Agreement items.

- Visit relevant government agencies in Shanxi province and learn the reform status of local coking industry, the internal and external market and the fulfillment of related policies. Discuss with coking experts on the present situation, its development prospect and the obstacles that the industry is faced with.

4. Others

4.1 Project Budget

Part I.

1 Salary and Honorarium for professional service

	Name	Post	Calculation		Amount
			Month	Rate	
A	Wang Hui	TVE and organization expert	2.5	$4,000	$10,000
B	Yao Xiangjun	Energy and environment policy expert	2	$3,000	$6,000
C	Meng Zhaoli	Voluntary Agreement expert	3	$3,000	$9,000
D	Tian Yishui	Energy efficiency expert	3	$2,000	$6,000
E	Cao Fengzhong	Environment policy expert	2	$2,000	$4,000
F	Tang Min	Training expert	2	$2,000	$4,000
G	Zhou Hong	Legal expert	4.5	$2,000	$9,000
	Subtotal				$48,000

2. Allowance

A	Working Site	None	$0
B	Project inception and fianl statement		
C	Others (Please indicate)	None	$0
	Subtotal		$0

3 Traveling Cost (See Part II for details) $14,795

4 Reporting $2,100

5 Other direct cost

A	Correspondence		$761
B	Local transportation in Beijing		$1,333
[redacted]			
6	Equipment and materials		
A	Equipment		$0
B	Material s		$2,511
[redacted]			
7	Project Subcontract	Non applicable	
	Total (1-7)		$69,500

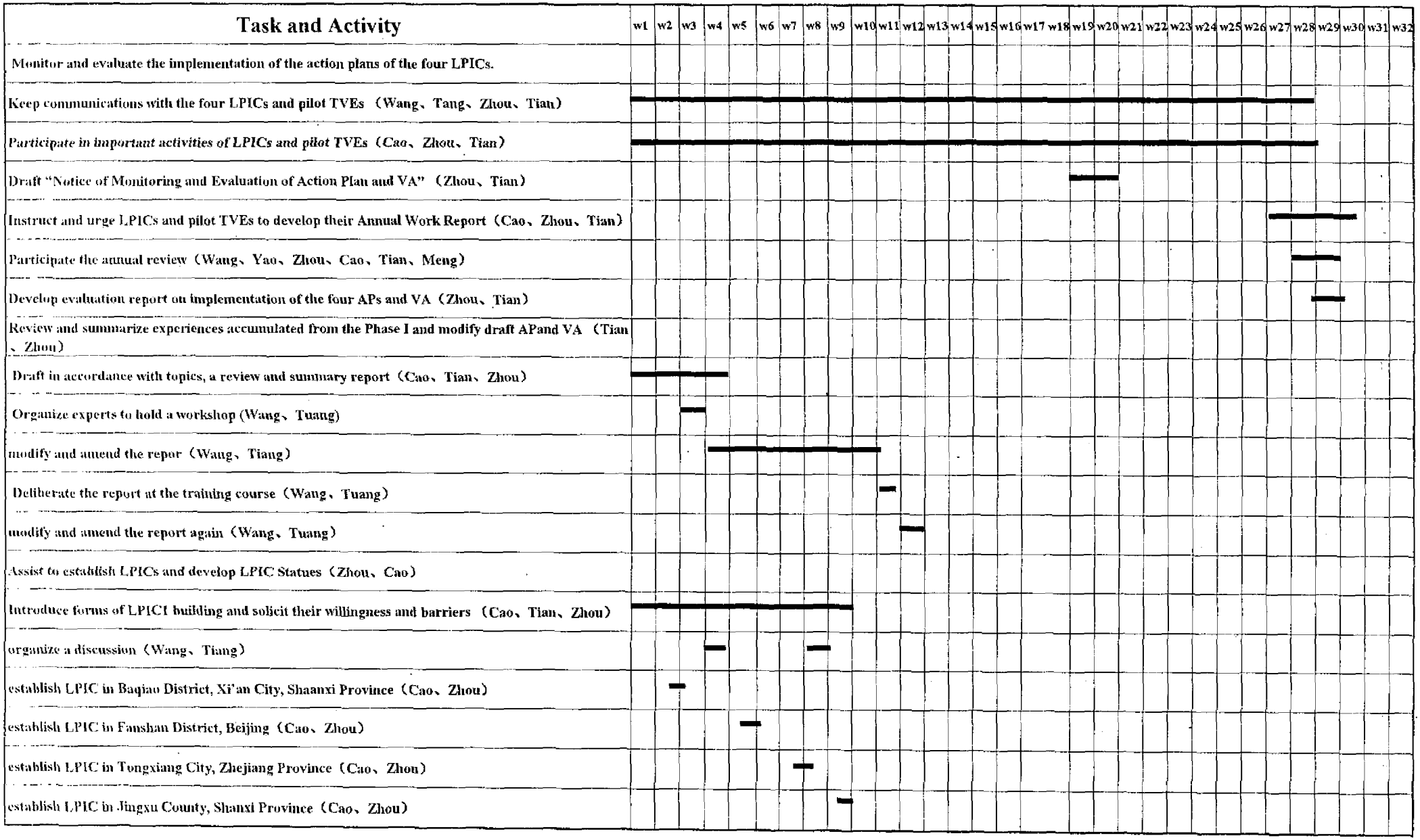
Part II

A	Currency requirement		
a	Currency on Project Undertaker side		$69，500
b	Local Currency		$0
c	Other Currency		$0
B	Travel costs in details		
1	Project inception and final statement		
a	Double ways or single way		
b	Departure from_____ and arriving at_____		
c	Mode of transportation		
d	Travel cost		
e	Journey time for one way		
f	Traveling Participants and traveling objectives		
g	Salary for the participants (included in Salary & Honorarium for professional service)		
2	Trips to project sites (Demonstration counties)		
a	Double ways or single way:	Double ways	
b	Departure from__/arriving at__	Beijing/Shaanxi, Shaanxi/Shanxi, Shanxi/Zhejiang, Zhejiang/Beijing	
c	Mode of transportation	Plane	
d	Travel cost	$750 per person for flight	
		$300 per person for Accommodations for 3 days	
	Subtotal	$5,200	
e	Journey time	2-3 hours	

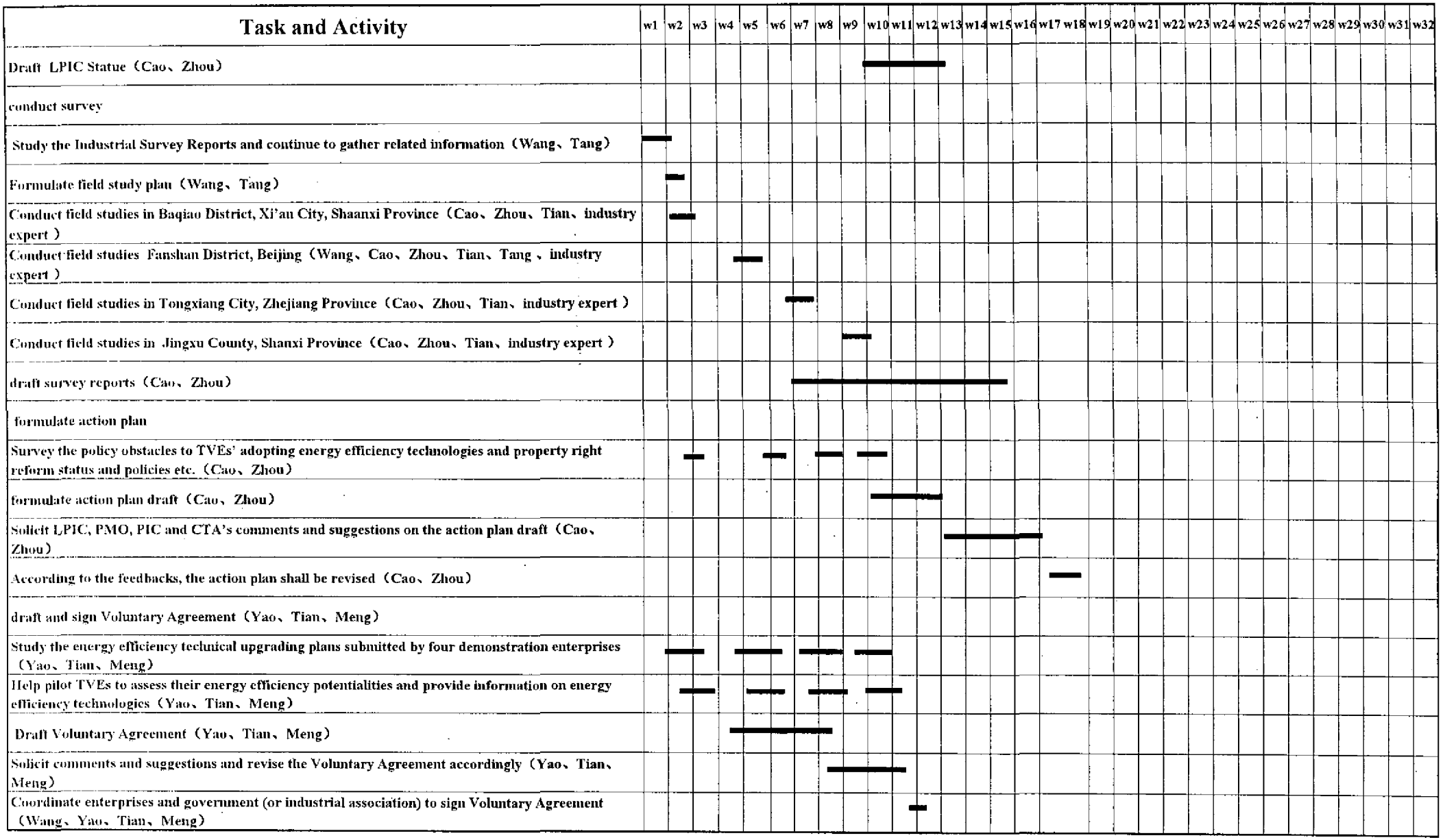
f	Traveling Participants and traveling objectives	Tian Yishui, Zhou Hong, Cao Fengzhong	Investigation and interviews
g	Salary for participants	Included in Salary & Honorarium for professional service	
2	Travel costs for the trainings		
a	Double ways or single way:	Double ways	
b	Departure from__/arriving at__	Beijing/Demonstration Counties	
c	Mode of transportation	Train	
d	Travel cost	$105 per person for train tickets	
		$400 per person for Accommodations for 5 days/ 1 week	
	Subtotal	$9,595 for 19 persons	
e	Journey time	12-25 hours	
f	Traveling Participants and traveling objectives	LPIC members and TVE Staffs from Demonstration Counties and the project experts	Training
g	Salary for the participants	Non applicable	

4.2 Project Timetable

4.2 Project Timetable



4.2 Project Timetable



4.2 Project Timetable

Task and Activity	w1	w2	w3	w4	w5	w6	w7	w8	w9	w1	w1	w1	w1	w1	w1	w1	w1	w1	w1	w2	w2	w2	w2	w2	w2	w2	w2	w2	w2	w3	w3	w3
Revise the Assessment Systems for Action Plan and Energy Efficiency Voluntary Agreement																																
Summarize the assessment work conducted in task 1 and discuss the problems identified during practical operation in the two systems（Tian、Meng、Zhou、Chao）																																
Work out solutions to these problems（Tian、Meng、Zhou、Chao）																																
Revise the two Assessment Systems（Tian、Meng、Zhou、Chao）																																
training																																
Design detailed training plan（Wang、Tang）																																
Discuss training plan with PMO, PIC and CTA（Wang、Tang）																																
Prepare for the detailed training material（Wang、Tang）																																
Carry out the training（Wang、Tang）																																
progress reports																																
draft interim report（Wang、Tang）																																
Solicit comments and suggestionsof PMO、CTA、PIC（Wang、Tang）																																
revised the interim report draft （Wang、Tang）																																
Submit the reports to UNIDO（Wang、Tang）																																
develop the draft final report（Wang、Tang）																																
Solicit comments and suggestionsof PMO、CTA、PIC（Wang、Tang）																																
revised the draft final report （Wang、Tang）																																
Submit the reports to UNIDO（Wang、Tang）																																
Solicit comments and suggestionsof PMO、CTA、PIC（Wang、Tang）																																
revised the draft final report （Wang、Tang）																																
Submit the reports to UNIDO（Wang、Tang）																																

Annex11.2.1:

Statute of Policy Implementation Committee,

Baqiao District, Xi'an

General Provisions

Clause 1 Nature

Baqiao District, Xi'an Policy Implementation Committee (hereinafter referred to as the LPIC) is an institution under the leadership of Baqiao District, Xi'an municipal, which is established to assist the local cement sector in applying high efficient energy saving technology and tackling various barriers to the application.

Clause 2 Objectives

The objective of the LPIC is to disseminate energy efficient technology and introduce high efficient management system at TVEs to produce high quality and energy efficient cement thereby reducing energy consumption and GHG emissions and promoting the sustainable development of cement TVEs in Baqiao District, Xi'an.

Organization of the LPIC

Clause 3 The membership of the LPIC

The membership of the LPIC is comprised of eight parties including the municipal office, Bureau of Economic and Trade, Bureau of Science and Technology, TVEs (SMEs), Baqiao District, Xi'an Environmental Protection Agency, Bureau of Finance, Bureau of National Tax, Bureau of Local Tax and Baqiao District, Xi'an Branch of ABC.

Clause 4 Delegation of the LPIC.

The LPIC shall have 8 delegates from the above-mentioned eight member parties. Each of the delegates should be the director of each of the eight parties.

Clause 5 Terms of the delegates

The delegates, to be nominated by the municipal, shall serve a term of three years. If any member party wishes to renew its delegate to the committee, a written application for the renewal should be submitted to the office of the municipal for approval. A nominee could not be a former delicate of the LPIC unless he has got the approval.

Clause 6 Director of LPIC

The LPIC will instate one director and one executive deputy director. The vice mayor of the municipal shall take the post of Director, and the director of the Bureau of Economic and Trade shall be the executive deputy director of the LPIC. The Deputy Director can take care of routine matters as Director in his absence. In addition to the normal duties and obligations of a delegate of the LPIC, the Director (or acting Director) chairs meetings of the LPIC, signs Minutes and formal correspondence on behalf of the LPIC.

Clause 7 LPIC Office

Under the LPIC, an office is established to be in charge of handling routine matters and communications with the PIC and the project management office of the UNDP/GEF Chinese TVEs Project. The office is located in the office building of the municipal Bureau of Economic and Trade.

Clause 8 Staffing

The office staff consists of local policy experts, the other staffs of the Bureau of Economic and Trade.

Functions of the LPIC

Clause 9 Main responsibilities of the LPIC

Main responsibilities of the LPIC are, under the guidance and with the coordination of the national PIC and the national project management office, to facilitate to remove barriers encountered by the local cement TVEs to policy enforcement. Detail responsibilities include the following.

1. Develop and implement action plan aimed at promoting regulatory reform related to the monitoring of energy efficiency at cement TVEs, and facilitation of the transform of the project implementation into a market-oriented mechanism.
2. Push forward TVEs to sign the VA with local government authorities.
3. Provide TVEs with information regarding latest technologies, industrial policies and management related to energy efficiency regularly;
4. Promote the enforcement of national and local policies, regulations and standards related to energy efficiency, technical renovation and environmental protection within cement sector in Baqiao District, Xi'an.
5. Establish and implement an effective and incentive mechanism for energy efficiency for and within local TVEs.
6. Recommend advanced TVEs and individuals in EE to the PIC for encourage and reward purpose.

Clause 10 Responsibilities of member parties

1. The municipal office, together with the Bureau of Economic and Trade should be responsible for coordination matters.
2. The Bureau of Economic and Trade and Bureau of Science and Technology should be responsible for providing instructions to the cement sector in technical renovation for EE.
3. The municipal Bureau of Finance, Bureau of National Tax and Bureau of Local Tax shall be responsible for providing instruction and support to local TVEs in regards of financial and taxation matters.
4. The municipal Environmental Protection Agency assumes the

responsibility of providing advises on policy enforcement related to environmental protection, EE and pollutant/emissions quota distribution and conduct "environmental impact assessment" in the sector.

5. The Baqiao District, Xi'an Branch of ABC should be responsible for providing advice to TVEs in regards of financial matters.

Working Procedures

Clause 11 working forms

The LPIC operates by means of meetings, once half a year. The Director, or the executive deputy director at the director's absent, will chair the meetings. A meeting will be considered duly valid if more than 50% of its members are present.

Clause 12 Interim meetings

The LPIC Director may call interim meetings as per the request of PIC and the PMO.

Clause 13 Reporting system

Minutes of meetings and progress reports will be submitted, by means of telephone or e-mail, to the national PIC and the project management office on a regular basis.

Supplementary Articles

Clause 14 This statute will become effective on the date after it is discussed and approved by all LPIC members. The LPIC reserves the right for the explanation of this statute.

Annex 11.2.2:

Action Plan of the LPLC of Baqiao District, Xi'an city

1. Project Background

The project of "UNDP/GEF Energy Conservation & GHG Emission Reduction in Chinese TVEs" has been funded by GEF. The aim of the project is to help Chinese TVEs that engaged in brick-making, cement, casting and coking to adopt energy efficiency technologies and to reduce GHG emission.

During the project's first phase, the market, policy, technical and financial obstacles to the adoption of energy efficiency technologies have been identified and evaluated and strategies to remove the obstacles have been formulated.

During the second phase, it has been proposed to establish top-down LPLC both at central and local level. The LPLC shall be the new mechanism to remove the policy obstacle and to promote energy efficiency in Chinese TVEs by adopting a market transformation approach.

In order to realize the objectives set for the project's second phase, to create a sound environment for the demonstration enterprises and the brick industry that these enterprises belong to, to promote the implementation of policies, laws and statutes, to establish a mechanism favorable for enterprises to adopt energy efficiency and GHG emission reduction and to extend the experiences accumulated by the demonstration enterprises, The county-level LPIC of Baqiao District in Xi'an city has formulated the action plan.

2. Major obstacles to Baqiao TVEs' adopting energy efficiency technologies

① Local annual income per capita is 3270 Yuan and under-finance is a major barrier against TVEs' adopting new technologies;

② Traditional belief and traditional habit of producing and using brick has hampered new technology adoption;

③ The supervision and law enforcement for forbidding the use of solid brick has been quite inadequate;

④ The education level of brick industry staff is low;

⑤ Environment policy has not been strictly implemented by Baqiao brick industry.

3. Objective

(1) Short-term objective (2003-2005)

① The government signs *Energy Efficiency Voluntary Agreement* with demonstration enterprises.

② To extend energy efficiency technologies and to realize the objective of decreasing unit product's energy consumption by 10% (with the data of 2003 as baseline)

③ To establish an effective mechanism for brick industry's sustainable energy efficiency and GHG emission reduction.

(2) Medium and long term objectives (2006-2008)

① In 2008, compared with the data of 2003 (baseline), the ultimate objective of decreasing unit product's energy consumption by 15% shall be realized.

② To extend the demonstration enterprises' voluntary Agreement model in brick industry and to establish enterprises' self-improving mechanism to promote energy efficiency by adopting a market transformation approach.

4. Implementing Plan

(1) Government signs EE Voluntary Agreement with demonstration enterprises

Time: July 2004—December 2005

Objective: Government signs Energy Efficiency Voluntary Agreement with demonstration enterprises; energy efficiency technical upgrading shall be finished before December 31, 2005 and unit product's energy consumption be decreased by 10% compared with the data of 2003 (baseline). By December 31, 2008 unit product's energy consumption be decreased by 15%.

Tasks:

① Consult with enterprises and formulate energy efficiency technology upgrading plans that are to be assessed;
② Identify barriers to the implementation of the plan;
③ LPIC consults with local government and formulate incentive policy;
④ Work out Energy Efficiency Voluntary Agreement together with demonstration enterprises;
⑤ Consult with PLC and RCF and provide technical and financial support;
⑥ Sign Energy Efficiency Voluntary Agreement; (See Energy Efficiency Voluntary Agreement for detailed incentive policies and Energy Efficiency indexes)
⑦ According to the stipulations of Energy Efficiency Voluntary Agreement, the implementing progress of the tasks is to be supervised by the third party that has been confirmed by the parties involved in Energy Efficiency Voluntary Agreement;
⑧ Summarize the experiences accumulated by demonstration enterprises and get ready for extending the experiences in Baqiao District's brick industry.

(2) Confirm extended enterprises

Time: July 2004 to December 2005

Objective: LPIC extends Voluntary Agreement mechanism in Baqiao District

Tasks:

① Train people from local brick industry and publicized GEF project;
② Conduct survey of brick TVEs in Baqiao District;
③ Collect information of TVEs that are willing to conduct energy efficiency technical upgrading;
④ Assist Beijing Hongyuan Energy and Environment Protection Ltd. to choose extended enterprises;
⑤ Sign Voluntary Agreement with extended enterprises.

(3) Apply to establish Baqiao District New Wall Materials Base

Time: July 2004 to December 2006

Objectives: Successfully establish Baqiao District New Wall Materials Base

Tasks:

① Conduct survey of brick TVEs in Baqiao District;
② Collect practical brick industry technologies;
③ Collect laws, regulations and standards that are relevant to brick industry;
④ Collect documents relevant to applying to establish New Wall Materials Base;
⑤ Learn the procedures for base construction;
⑥ Discuss the feasibility to apply to establish the base;

⑦ Formulate application materials;
⑧ Apply to relevant agencies;
⑨ Arrange work according to government agencies' requirements.

(4) Cooperate with Xi'an Wall Reform Office to conduct law enforcement inspection on the work of forbidding the use of solid clay brick

Time: July 2004 to December 2008

Objectives: Learn how the Implementing Opinions on Forbidding the Use of Solid Clay Bricks before Certain Time Limit and Some Rules on Promoting Building Energy Conservation and Wall Materials Reform in Xi'an City have been implemented.

Tasks:

① Coordinated by local Construction Bureau and local Economy and Trade Bureau, local government office shall issue a document to collect the overall information on the newly built, rebuilt and extended constructional projects;
② Check whether the constructional projects have got building permissions issued by local construction administrations;
③ Check whether the constructional projects pay the Wall Materials Fund according to the estimated building area and the standard of 6 Yuan per m^2;
④ Check whether the use of solid clay brick is forbidden in areas where government order has covered;
⑤ Learn how new wall materials have been used by farmers when they build their own houses;
⑥ Check how those violate the Implementing Opinions on Forbidding the Use of Solid Clay Bricks before Certain Time Limit are punished;
⑦ Summarize the law enforcement inspection.

(5) Special shows shall be arranged for publicizing the idea of forbidding the use of solid clay brick during Baqiao District's Science and Technology Spring time

Time: Every March from 2005 to 2008

Objective: Increase the public awareness of the significance of using energy efficient building materials and the disadvantages of solid brick

Tasks:

① Hand out pamphlets during market time;
② Play VCDs or pictures on Solid Clay Brick and Hollow Brick during the activities of extending scientific and technical ideas to farmers;
③ Post pictures and broadcast ideas on publicity caravan.

(6) Shoot popular science pictures on Solid Clay Brick and Hollow Brick by local governmental publicity department

Time: October 2004

Objectives: conduct public awareness campaign in order to publicize the ideas of energy conservation and scientifically choosing brick.

Tasks:

① Formulate action plan;
② Invite people from local Wall Reform Office, Economy and Trade Bureau, institutes engaged in building designing and construction, scientific and technical institutes and brick TVEs to participate in discussing the action plan;
③ Local governmental publicity department is responsible for shooting the pictures.

（7）Conduct theme meeting in rural primary schools, focusing on *Science close to you: Energy intensive solid clay brick and energy efficient hollow brick*

Time: winter holiday in 2006

Objectives: Conduct theme meetings in the form of experiments and popular science lectures and help students to change their traditional belief of solid brick.

Tasks:

① Local Communist Youth League Committee issues proposal to rural primary schools and calls on theme meetings focusing on *Science close to you: energy intensive solid clay brick and energy efficient hollow brick*;

② Local Communist Youth League Committee organizes primary school teachers to design experiments in order to help students to learn the difference between solid brick and hollow brick;

③ Conduct theme meetings in rural primary schools;

④ Play popular science picture on Solid Clay Brick and Hollow Brick;

⑤ Conduct experiments in different grades;

⑥ Conduct a theme meeting, focusing on *Tell your parents the scientific knowledge close to you*. Hopefully, the children's beliefs and ideas shall influence their parents and change their old ideas about solid brick;

⑦ Select Energy Conservation Star in every school.

（8）Conduct workshop on brick industrial policies and technologies

Time: October 2005

Objectives: Help TVEs to understand policy developments and domestic and foreign brick technology trends.

Tasks:

① LPIC inform local brick TVES to participate in the workshop;

② LPIC invited people from Shaanxi Provincial Wall Reform Office, Xi'an Wall Reform Office and Xi'an Wall Materials Institutes to introduce the following subjects:

-Domestic and foreign brick industrial technology developments

-Current wall materials reform policies

-Wall materials reform policies and prospects in Xi'an and in Shaanxi province

-Introduction of the work of forbidding the use of solid brick in other provinces or counties and briefing of wall materials reform policies adopted by Xiangyang city

③ TVEs, designing institutes and government agencies exchange their ideas on the barriers against the work of forbidding the use of solid brick.

（9）Organize the TVEs that signs Energy Efficiency Voluntary Agreement to participate in an on-the-spot meeting and introduce their experiences

Time: December 2007

Objectives: Publicize Energy Efficiency Voluntary Agreement

Tasks:

① Circulate energy efficiency technology upgrading pamphlets among brick TVEs and other energy-intensive enterprises

② Organize the TVEs that signs Energy Efficiency Voluntary Agreement to participate in an on-the-spot meeting and introduce their experiences.

③ Organize a workshop to discuss the possibility and barriers for adopting Energy Efficiency Voluntary Agreement in brick TVEs

④ TVEs sign Energy Efficiency Voluntary Agreements with government.

Annex11.2.2.1:

Report on Study Tour of LPIC in Baqiao district of Xi'an city for UNDP/GEF Energy Conservation & GHG Emissions Reduction in Chinese TVES – Phase II project

According to the framework and requirement of *UNDP/GEF Energy Conservation & GHG Emissions Reduction in Chinese TVES – Phase II*, a study tour group, led by Ms. Wang Guiling, PMO deputy director, consisting of subcontractor experts and technical professionals, went to Baqiao district, Xi'an city, Shaanxi province and conducted a five-day tour from June 14 to 17, 2004(See attachment for detailed activities and name list of the participants). Workshops, field study and questionnaire answering had been held in order to remove the market, policy, technical and financial obstacles that have been identified in the process of producing, marketing and applying energy efficiency technology in Baqiao district's brick industry. Another object of the tour is to direct the establishment of LPIC in the district and promote its capacity building. In order to guarantee the quality and effectiveness of the tour, Dr. Zhang Zhihong, UNIDO Chief Technical Advisor, was invited to participate in the tour. The field study results are as follows:

1. Brief Introduction of Brick Industry in Baqiao district

Baqiao district is 10 km east of Xi'an city, covering 332 km^2. There are 4 towns and 5 subdistrict, total population 500 thousand. Baqiao district enjoys convenient transportation conditions and it is the center of Shaanxi Province's 米-shaped highway network. Three big rivers, Chan river, Ba river and Wei river run across the district and there are about 10 transformer stations across the district, providing enough water and power for its development. The district is also culturally deep-rooted and there are Banpo relic, representing Yangshao culture, and Mijiaya relic, representing Longshan culture.

Brick industry in Baqiao district enjoys a long history. In 1950s planned economy period, there were 3 brick factories in Xi'an city, two of them located in Baqiao district due to the reason that Baqiao has a great number of plateau and the soil quality is fit for brick making. Currently, there are 52 brick enterprises in the district, 21 making hollow bricks. All these brick enterprises cover 5000-mu land and about 2.1 million m^3 land is consumed every year. As indicated in table 1, the output value of all the TVEs in Baqiao district in 2003 was 6.59 billion RMB Yuan, among it brick TVEs 91.5 million Yuan, representing 1.4% of the total. 60643 people have been employed by TVEs, among it 5200 in brick TVEs, representing 8.6% of the total.

Table 1 Basic Data of Brick Industry in Baqiao district

	Unit	Brick industry		TVEs		Percentage of brick industry to TVEs in 2003 (%)
		2002	2003	2002	2003	
Number of Factories		52	52	4103	4426	1
Total output value	10^4 RMB Yuan	1144	9150	6590	6944	1.4
Initial fixed capital	10^4 RMB an	9000	9000	6661	7837	12
Staff employed	Person	5200	5200	5154	6064	8.6
Total profit payments and tax turnover	10^4 RMB Yuan	2800	2800	3376	3972	7

The output value of 52 brick enterprises in Baqiao district is 91.5 million Yuan, 49% of the total output value of local building materials industry. 5200 staff employed by brick TVEs represents 70% of the total number of staff employed by local building materials industry. The total output of local brick industry is 915 million pieces.

Table2: Basic Data of Brick Industry and Constructional Materials Industry in Baqiao district

	Unit	Brick industry		Constructional Materials Industry (CMI)		% Of brick industry to CMI in 2003
		2002	2003	2002	2003	
Number of Factories		52	52	88	88	59
Total output value	10^4 RMB Yuan	11440	9150	22840	18700	49
Initial fixed capital	10^4 RMB Yuan	*9000*	*9000*	*22400*	*22400*	*40*
Staff employed		5200	5200	7400	7400	70
Total profit payments and turnover	10^4 RMB Yuan	2800	2800	3910	3910	72

Brick industry is energy-intensive and 118970 tce was consumed in 2003. Total CO_2 emission was 297425 Ton. The adoption of energy efficiency and GHG emission reduction technologies shall contribute to local environment quality improvement.

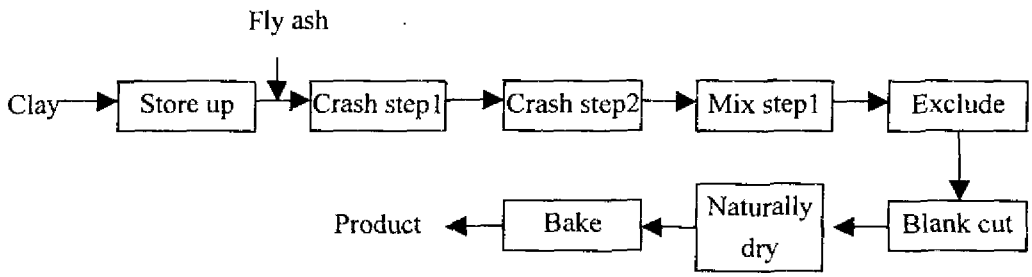
Table 3: Energy Consumption and CO_2 Emission of Brick Industry in Baqiao district Baqiao district

Year	Unit	2002	2003
Output	10^4 pieces	114400	91500
Energy consumption Per Unit	Tce per 10^4 pieces	1.4	1.4
Total energy consumption	Tce	*148720*	*118970*
CO_2 emission	Ton	371800	297425

2. Brief Introduction of the Demonstration Enterprises

Xi'an Liucun Hollow Brick Plant (hereinafter the Plant) was established in 1962. The Plant is located in Liucun Village in the suburbs of Xi'an City, Shaanxi Province. It occupies an area over 80 *mu* (1 *mu* = 1/15 hectare) and has a fixed asset of 3 million Yuan. The Plant registers an annual production of 34 million bricks (common brick equivalent). Main products are hollow bricks with hole ratio of 25% or more than 25%.

Main production equipments currently employed at the Plant include 2 sets of rollers, 2 sets of puddle mixers, 1 set Type-40 double-stage de-airing extruder, and 3 sets of 26-chamber Hoffman kilns. The technical process is:



Energy Consumption of the Enterprises is as follows:

Energy Consumption in 2003

Type of Energy	Consumption Quantity	Coefficient	In tce	CO_2 Emission (t-CO_2)
Raw Coal (t)	4,000	0.8000	3,200	9417.6
Fly ash (t)	7,900		0	
Electricity (kWh)	1,400,000	0.383×10^{-3}	536.2	1395.8
Total			3,736.2	1,929.383
Production (10k standard brick)			3,199.4	
Energy Consumption per unit product (tce/10k standard brick)			1.17	

3. Local Administration System of Brick Industry and LPIC Building

Brick industry in Baqiao district has been administrated by Baqiao District Economy and Trade Bureau. Local Construction Bureau is in charge of brick usage and local Building Materials Quality Testing Station in charge of quality testing. On June 14, 2004,LPIC for UNDP/GEF Energy Conservation & GHG Emissions Reduction in Chinese TVES – Phase II project was established according to a document issued by Xi'an Government Office. The director of LPIC is local deputy governor, and deputy directors are administrator of Baqiao Economy and Trade Bureau and deputy director of local government office. LPIC's members include local Science and Technology Bureau, Environment Protection Bureau, Land Bureau, Agricultural Bank Branch, Construction Bureau and local Building Materials Quality Testing Station. The Management Office is set in Baqiao District Economy and Trade Bureau.

The fact that deputy governor directs LPIC helps to integrate LPIC's work into government work plan and makes it easier to win other agencies' support. Local Economy and Trade Bureau is responsible for TVEs' macro management, guidance, coordination, supervision and service. It is familiar with local TVEs. The Management Office is set in local Economy and Trade Bureau helps

LPIC operate smoothly. Local Science and Technology Bureau and Environment Protection Bureau can play an active role in LPIC's technical extension, technical planning and environment protection. Local Construction Bureau and Building Materials Quality Testing Station can facilitate industrial cooperation. Local Land Bureau and Agricultural Bank Branch can provide support for land and finance mobilizing.

4. Property Right of Baqiao district's Brick Industry

Property right reform has been conducted since reform policy been implemented in rural China. At the beginning of reform, most brick enterprises were collectively owned and TVEs' property right reform was not started until 1991.

The technical process adopted by local brick TVEs is natural drying and most TVEs cover more than 100 mu land. The land is owned by towns or villages. Therefore, property right reform is conducted in the form of contract. With separated ownership and management right, the contractor signs contract with township government or village committee. Normally, a contract is valid for 5-30 years and a certain amount of contracting fees have to be paid.

Among the 52 brick TVEs, only one enterprise remains collectively owned and it shall be contracted in the near future.

Table 4 Survey results of brick TVEs' property right reform in Baqiao district

No.	TVEs' name	Output (10^4 pieces)	Kiln doors	Property right reform time	Contract term(Year)	Newly added investment after the reform (10^4 Yuan)
1	Baling Hollow Brick Factory	2800	40	1995	10	50
2	Shijiadao Brick Factory	2000	32+24	1993	5	45
3	Molingmiao Brick Factory	2000	28	1995	10	160
4	Xiangyangou Brick Factory	1600	40	1993	15	100
5	Jiayan Building Materials Factory	1500	28	2003	20	30
6	Shenlufang New Building Materials Factory	1600	38	1991	10	60
7	Shenlufang the Fifth Brick Factory	1600	38	1991	10	80
8	Hongyan Brick Factory	1000	26	1996	15	40
9	Shenwei Wall Materials Factory	2550	28	2003	30	130
10	Wangkezhai Brick Factory	1500	28	1995	30	60
11	Xiangfa Brick Factory	1700	28	1995	10	78

Property right reform has greatly promoted the development of local brick industry. According to the response of 11 surveyed TVEs, property right reform has promoted enterprises to make decisions independently and rapidly according to market demands for technical upgrading. Table 4 shows that the total fund invested in technical upgrading has reached 8.33 million Yuan. For example, after signing the 30-year contract, Shenwei Wall Materials Factory invested 1.3 million Yuan in 2003 for technical upgrading. After property right reform, capital of various nature including social fund has been oriented into brick industry. The relation between financing and benefits has become clear and financers are greatly motivated to invest in brick industry. All these are helpful for local brick industry's technical progress.

5. Policies Relevant to Brick Industry in Baqiao district

(1) The effect of More Water and More Green Program on local brick industry

Xi'an is well known for its long cultural and civilization history and Baqiao district is near to Xi'an city. In 2002, local ecological economy oriented development strategy was specified by local government and *More Water and More Green Program* was launched.

It has been known that eight rivers runs through Chang'an and three of them runs through Baqiao ever since old days. The *More Water and More Green* Program has been assured by these three rivers: Chan river, Ba river and Wei river. The total course of these three rivers is more than 50 km and there are 8 substricts along the rivers, covering 160 km2 land that can be developed and benefited from the program.

The *More Water and More Green* Program aims to effect a breakthrough in harnessing and developing the three rivers. A 100-hundred-mile green corridor and 10000-mu ecological green land and commercial forest shall be built in order to develop urban lung and effectively utilize local resources. Since 2003, local government has made great efforts to harness Chan river and Ba river. The river ways have been cleaned, the banks been lined and rubber dams been built. The local water surface has reached 5000 mu. More than 100 thousand trees have been planted on the sands and shallows-tidal-flat areas in Ba River and Wei river delta. A 30-meter-wide greenbelt and a 10-meter-wide road have been built along Wei River.

On January 11, 2004, The Baqiao District Government Work Report specified that ecological economy oriented development strategy is the overall objective and local government also stresses *More Water and More Green* construction and local urbanization.

Influenced by the above-mentioned policies, about 52 solid brick TVEs that were located in the *More Water and More Green Program* area were closed. The total number of brick TVEs dropped from 104 in 2002 to 52. The *More Water and More Green* Program has unintentionally contributed to the forbidding the use of solid brick production.

(2) Forbid the use of solid clay brick

In June 2001, State Economy and Trade Commission issued *Notice on Including 10 Capital Cities into the Name List of Cities that are Forbidden to use Solid Bricks before Certain Time Limit* and Xi'an city was listed as one of the ten cities. According to the notice, the use of solid clay brick shall be completely forbidden by June 30, 2003. The No. 59 document, Shaanxi Provincial Managing Rules on Wall Materials Innovation and Building Energy Conservation, which was issued by Shaanxi government, specifies that it is forbidden to use solid brick to build walls, temporarily built establishments and other constructional work in Xi'an city.

Based on these documents, the *Implementing Opinions on Forbidding the Use of Solid Bricks*

before Certain Time Limit Bricks was jointly issued by Xi'an Rural and Urban Construction Committee and Xi'an Economy Committee in March 2003.

As to the use of solid clay bricks, this document makes it clear that since January 1, 2003, it is forbidden to use solid clay bricks for any construction above horizon plane or any newly built, rebuilt and extended work conducted in high&new technical development zones, economic development zones and Qujiang Tour and Holiday Village that are located in the six suburban districts (Beilin, Xincheng, Lianghu, Yanta, Weiyang and Baqiao); since July 1, 2003, it is forbidden to use solid clay bricks for any newly built, rebuilt and extended work conducted in the exurban districts (Chang'an, Lintong, Yanliang, Lantian, Gaoling, Zhouzhi and Huxian. Farmers are encouraged to use new wall materials to build houses and the use of solid brick shall be gradually limited and forbidden.

It is also specified that since the day this document is issued, no solid clay brick factories shall be approved to be built, the old solid brick factories should change the line of production to hollow brick or other new wall materials and no relocated old factory is allowed to product solid clay bricks.

It is also specified that Xi'an Building Energy Conservation and Wall Materials Reform Leading Group Office (hereinafter referred to as Xi'an Wall Reform Office) is in charge of the work of forbidding the use of solid clay brick.

Xi'an began to extend the use of hollow bricks in 1990. According to the requirement of *Implementing Rules on Levying and Using New Wall Materials Fund*, before a constructional project is started, the Office shall levy Wall Materials Fund according to the estimated building area and the standard of 6 Yuan per m^2. If the constructor fails to pay the fund, he shall not get building permission. This has promoted the work of forbidding the use of solid clay brick.

Because of institutional reform, there are now only two people working for Xi'an Wall Reform Office and no administration has been built at district and county level. The inadequate law enforcement at district and county has contributed to the continuing use of solid clay bricks in seven exurban districts.

Xi'an Economy Committee is responsible for administrating brick TVEs and forbidding the production of solid clay brick. There are specific and detailed stipulations on forbidding the use of solid clay brick, but no definite stipulation on the time limit and the way to restrict solid brick production. Therefore, solid brick enterprises can keep producing solid brick and supply it to rural market and for constructions below horizon plane and this has brought negative effect on forbidding the use of solid bricks.

Although Both Xi'an Rural and Urban Construction Committee and Xi'an Economy Committee are responsible for forbidding the production and use of solid clay bricks, this work requires the participation of other government agencies. Actually, the communication of these two Committees is quite inadequate. Since the documents have been issued by these two committees, it is hard for other government agencies to cooperate.

According to the experiences accumulated in Shanghai, Chengdu and Beijing, the work of forbidding the production and use of solid brick needs inter-departmental coordination and the documents should be issued in the form of government order. Only Rural and Urban Construction Committee and Xi'an Economy Committee are not enough for this work.

(3) The plan to establish new wall materials base

The output value of brick industry in Baqiao district accounts for 50% of total building

materials industry output volume and 6% of total TVEs' output value. There are 52 TVEs engaged in brick industry, covering 5000 mu land. In order to make full use of local plateau resources, in 2003, local government planned to build base for producing new wall materials. According to the plan, the base is to be built around Hongqing Plateau and Bailu Plateau and all the brick TVEs are to be moved to the base in order to make good use of land resources. In the process of moving to the base, some brick TVEs shall be reconstructed. No new solid brick factories shall be built inside the base and solid brick production outside the base shall be gradually forbidden. The construction of the base shall effectively promote the adoption of new technologies and the production of energy efficient products.

Since 2003, China has adopted strict land management policy. In order to promote the healthy development of land market, China has made great efforts to consolidate land use in various development zones. In 2003, some documents were promulgated, including the State Council's *Urgent Notice on Further Consolidation of Land Market Order*, Land Resources Ministry's *Checking and Accepting Plan on Further Consolidation of Land Market Order*; and *Opinions on Investigating and Correcting Some Problems identified during further Consolidation of Land Market Order*. It is specified by these documents to consolidate land use in development zones and reinforce law enforcement. Under such policy conditions, the building of base for producing new wall materials has been temporarily delayed. But Baqiao district government shall continue to apply to higher authorities for approval of building the base and hopefully the base shall contribute to local energy conservation and GHG emission reduction.

(4) Tax system

According to the *Notice on Collecting Value-added Tax for Utilization of Some Resources and Other Products*, which was issued by Ministry of Finance and State Tax Administration on December 1, 2001, some new wall materials and products shall enjoy the preferential policy that only half of the value-added tax shall be collected. The TVEs that produce solid clay brick do not enjoy this preferential policy. In Baqiao district, brick TVEs pay taxes at the rate of 6%. Since a part of brick is sold to individuals who do not need invoice, tax authorities have no way to supervise and control brick TVEs. For convenience's sake, some TVEs pay a fixed amount of tax to the government. Therefore, it is hard to use tax to guide TVEs to produce energy efficiency products

6. Environment Protection Policy

Currently, China's environment policies have been materialized by 8 environment management systems, including Environment Impact Assessment System for Constructional Projects; Three Qualifications System for Constructional Projects; Payment for Pollution Discharge System; Quantitative Evaluation System for Integrated Treatment of Urban Environment; Accountability System for Environment Protection Targets; System for Pollution Reporting and Registration and Pollution Discharge License; System for Centralized Pollution Control; and System for Time-limited Pollutant Treatment and Treatment of Hazardous Waste by Administrative Bodies.

As to the implementation of these systems, the following systems are closely related to TVEs: Environment Impact Assessment System for Constructional Projects; Three Qualifications System for Constructional Projects; Payment for Pollution Discharge System; System for Pollution Reporting and Registration and Pollution Discharge License and System for Time-limited

Pollutant Treatment and Treatment of Hazardous Waste by Administrative Bodies.

In June 2003, the Managing Rules on Levying and Using Pollutant Discharge Fees was issued by State Environment Protection Administration and put into force on July 1, 2003. The Provisional Method on Levying Pollution Fees, which was promulgated by the State Council on February 5, 1982, and the Provisional Method on Compensated Using Exclusive Fund for Pollution Source Treatment, which was promulgated by the State Council on July 28, 1988, was abolished at the same time.

According to it, the fee levying ways and scope has been adjusted: the former fee charging for pollution discharge that over a certain standard is changed to charge fee both for within-standard and over-standard pollution discharge. Formerly, fee was charged on the basis of one single over-standard factor. Now, various pollutants are converted into an equivalent pollutant and fee shall be charge according to the converted total pollution. The fee charged is included into government financial budget and managed as exclusive fund for environment protection. The expenses incurred by environment administrations are covered by government finance. In this way, the pollution discharge fee levying become or fair and reasonable.

With the new levying ways, pollution discharge fee is included into government budget. Environment protection authorities cannot deduct a percentage from the fee and they are no longer motivated to collect the fee. With local institutional reform, Environment Protection Bureau's establishment is fixed as 34 who are to serve all the local enterprises. In Baqiao district, the pollution discharge fee collected by local Environment Protection Bureau varies from 2000 Yuan to 8000. Some enterprises fail to pay up even such small amount of money.

7. Technology Status of the Brick Industry in Baqiao district

(1) Present technologies

There are 52 brick TVEs in Baqiao district. Among the total 48 production lines, 1 was designed by professional designing institute and the rest are designed by the TVEs themselves. All the technical process is natural drying rotary kiln. 21 TVEs produce hollow bricks, 31 produce solid clay bricks. Coal consumption per 10000 pieces of brick varies from 1.3 to 1.5 tons.

(2) Information sources

Table 5 Sources that brick TVEs learn technical information

Number of TVEs	Associations	Colleges, universities and scientific institutes	Domestic and foreign enterprises	Foreign countries	Governmen t agencies	Friends	Market
52	16	5	2	0	13	10	6

Table 5 shows that the major information sources include associations and government agencies, followed by friends. It can be concluded that government agencies play an important role and market plays a minor role in brick industry's energy conservation.

It can be learnt from table 6 that middle and high school graduates represent 4.5% of local brick industry staff and only 5.3% employees have got primary professional title. The low educational level of workers is not good for energy efficiency technology adoption and application.

Table 6: Statistics of the Technical Personnel in Brick Industry

		Percentage (%)
Total number of staff Employed	5200	
High professional title	0	0
Medium professional title	148	2.8
Preliminary professional title	127	2.5
Junior or senior high school	2830	54.5
other	2095	40.2

7. Market status of brick TVEs in Baqiao district

Brick produced in Baqiao district represents 33% output and sales volume of total in Xi'an and a great part of Baqiao brick is sold in Xi'an market, 1.14 billion pieces in total. Among it, about half is hollow brick and another half solid clay brick.

Solid brick still enjoys half of the market share. Solid brick is used not only for constructions below mark but also in rural areas. Influenced by the traditional belief that solid brick is more lasting, most farmers are willing to build their house with solid brick. Another reason is that solid brick is cheaper than hollow one. Table 7 shows the price difference between the solid and hollow brick.

Table 7 price difference between solid brick and hollow brick

Product	Price in 2003	Price in 2004
90 hollow brick	0.16	0.19
Solid clay brick	0.08	0.09

Actually, farmers' choice has begun to change since the total cost of building house with hollow brick is not higher than that with solid brick. In 2004, 40 pieces of 90 hollow brick is needed to build 1 m2 wall, about 7.6 Yuan. If solid brick is used, about 68 pieces are needed, about 6.12 Yuan. But the masonry joints are only 11 for hollow brick, while 17 for solid brick. Using hollow brick can reduce the use of sand and cement by 30% and manual work by 15%. A comprehensive calculation shows that using hollow brick is more cost effective. Hollow brick is superior in terms of heat insulation, seismic resistance and sound insulation than solid brick. When old house is torn down, hollow brick can be re-used, while solid brick can't.

Public awareness campaign must be strengthened in order to extend the use of hollow brick in rural areas.

Round-holed 90 perforated brick is the leading type in Baqiao district, accounting for 90%. 67% TVEs can produce rectangle-holed hollow brick. According to some expert's introduction, if the round-holed hollow brick is changed to rectangle-holed one, the TVEs cost doesn't increase while the perforation rate is increased from 25% to 33%. Suppose the coal consumption of brick industry in Xi'an is 220-250 thousand tce per year, if the brick is changed to rectangle-holed brick,

about 20 thousand tce can be saved every year, reducing CO2 emission by 50 thousand tons.

Round-holed hollow brick has been extended ever since 1991 and it has been accepted by end users, designing institutes and brick producers. In 2001, some TVEs tried to produce some rectangle-holed brick but it was rejected by the market. TVEs do not want to produce rectangle-holed brick because there is little market demand, designing institutes do not want to design and government do not want to extend because they are afraid there is no producer willing to produce.

Therefore, local government should strengthen public awareness campaign. The participation of government, designing institutes, producers and end users can effectively promote the extension and application of proper brick technologies.

8. The Financial Status of the Brick Industry in Baqiao district

The brick industry in Baqiao district has started when China's economic reform just began. 80% of the fund came from bank loan and collective fund. At that time, bank loan had been directed by administrative decisions.

With the development of China's market economy, most fund used for technical upgrading has been collected by enterprises themselves or from borrowing social fund and bank loan.

Some of fund has been accumulated by the enterprise itself and the fund borrowed from society includes fund borrowed from the managers and employees. Since Baqiao district is located between central and western China, where economy is quite underdeveloped, the farmers' annual income is 3270 Yuan per capita and the above-mentioned two parts of fund accounts for only a minor part of the total fund. With China's financial reform, the public-owned banks have been reformed into commercial banks. In the process of applying for bank loan, the key problem the enterprises faced with is the provision of mortgage. Since the brick factories utilize the rented resource and have no property right over the land, so the land cannot be mortgaged. Most factories have not enough equipment and workshop building as mortgage, so it is very hard for them to get loan. In 1996, People's Bank of China adopted the policy of deflation and "loan trace out all life". This policy has made local banks would rather turn over the savings than run the risk of granting loans to enterprises.

In recent years, bank loans have followed the pointed direction of the national policy and policy-oriented fund. This part of fund has been channeled to technology-intensive industries or trades that are closely related to national economy and the people's livelihood. Inadequate attention has been paid to industries such as brick production that are labor-intensive, low in technical content, small-scaled and distributed in remote areas. How to provide mortgage for enterprises, especially TVEs, has become the bottleneck restricting TVEs' adopting advanced technologies.

All the brick TVEs have adopted natural drying process. Suppose a TVE's annual output is 20 million pieces, it has to invest 550 thousand Yuan if natural drying process is changed to artificial drying. If its energy consumption remains unchanged, it can be concluded from Table 8 that with better process, continuous production can be realized and output is to be increased by 34%, drying land area drop by 90% and manpower be saved by 57%.

Table 8 Advantages and disadvantages of natural drying and artificial drying

	Artificial drying	Natural drying
Output (10^4 pieces)	2700	2000
Continuous production	Can be done	Can't be done
Land needed for drying	3 Mu	30 Mu
Labor needed for drying	15 人	35 人

Artificial drying is a quite mature technology and the reason that it has not been widely adopted is TVEs' lack of fund.

TVE technical upgrading discount interest is the major government fund that is available for local TVEs. The total discount interest in Shaanxi province is 10 million Yuan and 2 million is allocated to Xi'an city. The threshold for apply this fund is very high, requiring that the enterprise's fixed capital is over 5 million Yuan. Therefore, brick TVEs can hardly apply for this fund.

As to new wall materials fund, according to Some Rules on Promoting Building Energy Conservation and Wall Materials Reform in Xi'an City, after finishing a project, the construction body applies to Xi'an Construction Committee for checking and acceptance. If the project reaches building energy conservation requirements specified when the project is approved, the building energy consumption extra charge paid by the construction body shall be refunded. If only part requirements are reached, then the corresponding extra charge shall be refunded. If no requirement is reached, no charge is refunded. The fund that is not refunded to the construction bodies shall be included in building energy conservation and new wall materials reform fund. Every year, about 10 million Yuan is levied and by now more than 100 million Yuan has been levied. This fund can be used for brick TVEs' technical upgrading. But in 1990s, 4 million Yuan was granted to the state-owned Xi'an Brick Factory for technical upgrading and the factory closed down soon after it got the fund. Ever since then, Xi'an Wall Reform Office has become extremely cautious about the use of the fund especially private enterprises are involved due to two reasons: first, they are afraid that the public might accuse them of bribery in handing out the fund and second, they have little ability to control and supervise the enterprise who might fail to pay back the fund.

9. Conclusions

(1) Brick industry's energy conservation and GHG emission reduction is closely related to local government's development plan of building an ecological economy oriented district. Proper choice of demonstration TVEs can bring notable demonstration effects.

(2) Demonstration TVEs must be typical. LPIC can play an important part in coordination and its work shall be integrated into local government's daily work.

(3) TVEs' property right reform has promoted TVEs' technical upgrading. The social fund has begun to pour into brick industry, but under finance is still a major barrier against TVEs' adopting new technologies.

(4) Traditional belief and traditional habit of producing and using brick has hampered new technology adoption;

(5) The work of forbidding the use of solid brick has achieved some results. But it is only effective for constructions above horizon plane. In rural areas, farmers still use solid brick to build house. The supervision and law enforcement has been quite inadequate.

(6) The education level of brick industry staff is low.

(7) Environment policy has not been strictly implemented by Baqiao brick industry.

10. Suggestions

(1) LPIC's work should be closely integrated into local government's development plan. One the one hand, support local ecological economy development and promote base construction. On the other hand, with the progress of More Water and More Green Program, the work of forbidding the use of solid brick shall be strengthened.

(2) Keep close contact with Xi'an Wall Reform Office and conduct survey on the law enforcement. Apply for new wall materials fund and learn the developments of policies on the work of forbidding the use of solid brick.

(3) Conduct public awareness campaign and change traditional ideas and encourage the use of hollow brick.

(4) Train brick entrepreneurs and organize them to visit other brick enterprises and help them to learn domestic and foreign brick technology trends.

(5) LPIC invites designing institutes, government agencies, producers and constructional bodies to conduct workshops.

Annex11. 2. 3:

Energy Efficiency Voluntary Agreement

BETWEEN

Government of Baqiao District, Xi'an City, Shaanxi Province
(Hereinafter referred to the Government)

AND

Liucun Hollow Brick Plant in Baqiao District, Xi'an City, Shaanxi Province
(Hereinafter referred to the Demonstration Enterprise)

1. Background

1.1 Energy Efficiency Voluntary Agreement is an agreement that is entered voluntarily by and between a trade organization or individual enterprise and the government in order to improve energy efficiency and reduce greenhouse gas emissions. Industry organizations or enterprises commit to meet the target of energy efficiency or GHG emission reduction, and the government provides preferential policies and/or other incentives to the industry organizations and the enterprises.

1.2 The Project of "Energy Conservation and Greenhouse Gas (GHG) Emissions Reduction in Chinese Township and Village Enterprises ("TVEs") – Phase II, sponsored by the GEF, was implemented by the United Nations Development Program (UNDP), and executed by the Untied Nations Industrial Development Organization (UNIDO) and Ministry of Agriculture (MOA) of the People's Republic of China. The purpose of the Project is to help Chinese township enterprises to adopt efficient energy conservation technologies and reduce the greenhouse gas emission from brick industry, cement industry, casting industry, and coke industry in China.

1.3 In order to formulate and implement action plans to promote regulatory reforms and commercialization of energy efficiency technologies and projects among TVEs, the Energy Conservation Voluntary Agreement is formulated so as to improve energy efficiency, reduce greenhouse gas emissions and carry out the national "medium-and-long-term special energy efficiency layout" in respect of generalization of the spirit of Energy Conservation Voluntary Agreement.

2. Targets of Energy Conservation

2.1 Through the Voluntary Agreement implement, the Government shall fulfill the transformation of governmental function and explore a new mechanism aimed to achieve the same energy conservation goal but without compulsory commands. Furthermore, the Demonstration Enterprise shall reduce production cost, improve product quality, protect environment, and thus, establish a better public image for the enterprise.

2.2 The Demonstration Enterprise establishes voluntarily the following direct Energy Efficiency targets: based on 2003 (reference year), by 31st December 2005, the Demonstration Enterprise shall complete the Energy Conservation Project and achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 10%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 15%.

2.3 Because the government adopts stricter environmental standard and more energy is consumed, the targets shall be adjusted if the conditions occur.

3. Measures for Energy Conservation

3.1 In order to fulfill the target of Energy Conservation on time, the Demonstration Enterprise shall establish a concrete Energy Conservation Plan, which shall be reviewed and approved by the Government, and implement the plan carefully.

3.2 The Demonstration Enterprise shall enhance the energy management, establish energy management system and energy efficiency standards, improve the internal regulations, assign full-time energy manager to be responsible for the energy management, improve employee's consciousness of energy conservation

4. Preferential Policies

4.1 The government shall recommend Demonstration enterprises applying for the special energy conservation and technical innovation fund to Xi'an Science Technology Bureau. Depreciation acceleration can be applied to the equipment in the Clean Production List. Energy audit and training expense for the Energy Conservation Project can be included in the management cost. The proportional limit of cost of R&D on energy conservation can be increased and included in the management cost.

4.2. The Government committed to assist the Demonstration Enterprise in solving financing problems such as financing difficulties through the governmental credit system for medium- and small-scale enterprises and to recommend the Demonstration Enterprise to apply for recycling fund loan and other commercial loans, which will be used in the energy conservation project.

4.3. After the Demonstration Enterprise signs the Voluntary Agreement, the Government shall promise to recommend for the pilot program as well as award the honorable title to the Demonstration while introducing and extending the experience of the Demonstration Enterprise in the pilot on media.

5. Monitoring and Assessment

5.1 The Government shall submit an Annual Report on implementation of the Voluntary Agreement to the PIC in the first quarter of the year and receive the instruction from the PIC.

5.2 The Demonstration Enterprise agrees to receive assessment of the effect of the Voluntary Agreement implementation by a Technical Team established by an independent third party.

5.3 In the valid period of the agreement, the Demonstration Enterprise shall submit an annual Supervision Report to the Government and the Technical Team in written form in the first quarter every year, and submit the final report in the first quarter in the next year after the Agreement ends. The report shall include: production statistics, energy consumption data, status of implementation of Energy Conservation Plan and Energy Conservation Project, effect of energy conservation, problems and barriers, plan for the next year, measure adjustment, experiences and lessons, and suggestion for perfecting the Voluntary Agreement.

5.4 The Technical Team is responsible for evaluation in the implementation of the agreement, including the evaluation of the Energy Conservation Plan, Annual Monitoring Reports, the Interim Report, and the Final Report submitted by the Demonstration Enterprise. The Technical Team shall inform the assessment result in writing to the Government and the Demonstration Enterprise. The assessment report shall cover evaluated comments on the authenticity of data, the Energy Conservation Plan and projects of the Demonstration Enterprise, the status to meet the targets, and the suggestion on Agreement modification.

5.5 If the Evaluation Report indicates that the Demonstration Enterprise failed to meet the requirement that the Agreement defines, the Demonstration Enterprise shall adopt measures including identifying problems, seeking new energy conservation measures, improving the energy conservation efforts in the next year, modifying energy conservation plan, based on the advice from the Technical Team.

6. Modifications and Termination

The agreement shall be modified or terminated if the following conditions occur:

- ✧ The Laws, Regulations, or policies related to energy or environmental protection have big changes compared with the year when the agreement is signed.
- ✧ Implementation of the Agreement has negative impact to the development or normal operation of the Demonstration.

The agreement shall come into force from the date it is signed and be invalid on 31st Dec, 2008. Any pending matters in the agreement shall be discussed jointly between parties and an additional agreement shall be entered and being equally valid.

Government of Baqiao District, Xi'an City, Shaanxi Province (seal)	Liucun Hollow Brick Plant in Baqiao District, Xi'an, City, Shaanxi Province (seal)
Authorized representative	Authorized representative
Date:	Date:

Appendix:

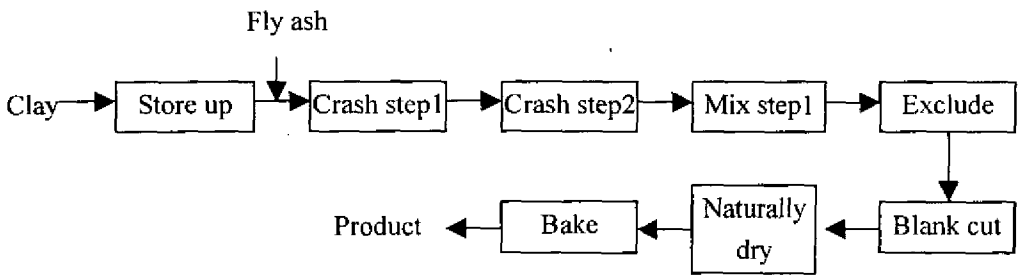
Liucun Hollow Brick Plant

Energy Conservation Plan

1 Brief Introduction of the Enterprise

The Xi'an Liucun Hollow Brick Plant (hereinafter the Plant) was established in 1962. The Plant is located in Liucun Village in the suburbs of Xi'an City, Shaanxi Province. It occupies an area of over 80 *mu* (1 *mu* = 1/15 hectare). The Plant registers an annual production of 34 million bricks (common brick equivalent). Main products are hollow bricks with hole ratio of 25% or more than 25%. Main production equipments currently employed at the Plant include 2 sets of rollers, 2 sets of puddle mixers, 1 set each of Type-50 and Type-40 double-stage de-airing extruder, and 3 sets of 26-chamber Hoffman kilns. (There is another 26-chamber kiln under construction by the Plant.)

The technical process is:



2 Energy Consumption of the Enterprises

Energy Consumption in 2003

Type of Energy	Consumption Quantity	Coefficient	In tce	CO_2 Emission (t-CO_2)
Raw Coal	4,000(t)	0.8000	3,200	9417.6
Fly ash	7,900(t)		0	0
Electricity	1,400,000(kWh)	0.383×10^{-3}	536.2	1395.8
Total			3,736.2	10813.4
Production (10k standard brick)			3,199.4	
Energy Consumption per unit product (tce/10k standard brick)			1.17	

3 Targets

The Demonstration Enterprise establishes voluntarily the following direct Energy Efficiency targets: based on 2002 (reference year), by 31st December 2005, the Demonstration Enterprise shall complete the Energy Conservation

Project and achieve the energy conservation target: reduce energy consumption per unit product by 10%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product by 15%.

4 Measures for Energy Conservation

4.1 Energy Management

The Demonstration Enterprise shall enhance the energy management, establish and perfect energy management system and energy efficiency standards, and improve the internal regulations.

	Measures	Effect
1	Establish an Energy Management Department, and assign full-time staff responsible for the energy management of the Company.	Estimate increase energy conservation rate by 1%.
2	Formulate the energy plan, and compile monthly energy consumption table.	
3	Adopt energy consumption ration management	
4	Establish energy measuring and monitoring system.	
5	Provide training on energy conservation to employees in order to improve their awareness on energy conservation and GHG emission reduction.	

4.2 Common Energy Conservation Measures

	Measures	Effect
1	Use high efficiency lighting products.	Estimate increase energy conservation rate by 2%.
2	Reduce the energy consumption of transportation vehicles through rational arrangement.	
3	Use recycling office products.	
4	Use renewable energy technologies and products.	
5	Use energy-saving products, including office equipment.	
6	Adopt computer system to improve the efficiency of company management and the energy efficiency.	
7	Add new monitoring and adjustment system for drying room and furnace to make full use of remaining heat.	
8	Use automatic coal feeding equipment to improve coal efficiency.	
9	Use electric motor with speed and frequency modulation	

4.3 Energy Conservation and Technical Innovation

In order to achieve the target of energy conservation on time, the Demonstration Enterprise shall adopt the following measures.

Measures		Expected Energy Conservation (tce/a)	CO_2 Emission Reduction(t/a)	Time
1	Clay treatment: Weatherize the clay for half a year to improve the internal structure of the clay.	448.34	1297.61	2004.6-2005.6
2	Clay milling: Replace the ordinary roller with a fine roll mill to improve the milling results.			
3	Clay pugging: Add this process to improve the physical property of the clay.			
4	Clay extruding: Replace the Type 40/45 extruder with a Type 50 extruder to raise productivity and lower electricity use.			
5	Brick firing: Replace an outdated kiln with an energy-efficient kiln to reduce energy use.			

5 Expected Output

Energy Conservation Measures	Expected Energy Conservation (tce/a)	CO_2 Emission Reduction (t/a)
Energy Management & common measures	112.09	324.40
Energy Conservation & Technical innovation	448.34	1297.61
Total	560.43	1622.01

Basic Information of the Demonstration Enterprise

Name: Liucun Hollow Brick Plant							
Address: Liucun Village, Baqiao District, Xi'an City						Zip: 710038	
Ownership: Stock system						Established in: 1962	
Contact: Ling Fuhe				Tel: 83576073		Fax: 83576073	
Information on Enterprises Quality							
Honors	Types	Name of Honors		Issued by		Date	
	Nation level						
	Province level						
Certifications	Type	Name		Validation date		Products	
	Quality Control System Certification						
Year		2001		2002		2003	
Product	Product type	Output (10k standard brick)	Value (10k RMB)	Output (10k standard brick)	Value (10k RMB)	Output(10k standard brick)	Value (10k RMB)
	Solid brick						
	Hollow brick	164,07	263.52	2,000	320	1,882	338.76
	hole ratio	rectangular slot: ≥25%, rectangular hole:26%					
Final total capital value(10k RMB)		130		150		200	
Work force(10k RMB)		156		156		156	
Floor area(m^2)		56666		56666		56666	
Style of kiln		Hoffman kiln		Hoffman kiln		Hoffman kiln	
Drying		Natural air		Natural air		Natural air	

Energy Consumption						
Year	2001		2002		2003	
Energy Consumption	Quantity	Coefficient	Quantity	Coefficient	Quantity	Coefficient
Coal (t)	3,584	0.800	4,250	0.800	4,000	0.800
Electricity (10k kWh)	141		140		140	
Fuel oil (t)	26		30		30	
Clay (t)	46,116	0.383	56,000	0.383	52,696	0.383
Fly ash (t)	6,900		8,400		7,900	

Annex 11.3.1:

Statute of Leading Group for the Promotion of EE and GHG Emissions Reduction in Shanxi Township and Village Enterprises

General Provisions

Clause 1

The Leading Group for the Promotion of EE and GHG emissions Reduction in Shanxi Township and Village Enterprises (hereinafter referred to as the Leading Group, or LPIC) is an institution under the leadership of Shanxi provincial government, which is established to assist coking TVEs in the province to generate power by introducing co- generation technology onto their "clean type" coking ovens and tackling various barriers to the introduction.

Clause 2

The objective of the Leading Group is to establish a high efficient coordination mechanism thereby promoting the waste heat power generation technology onto "clean type" coking ovens and reducing energy consumption. The Leading Group will promote the waste heat power generation technology in coking industry all over the province thereby reducing GHG emissions by coking industry and promoting the sustainable development of the coking TVEs and improving the environmental.

Organization of the Leading Group

Clause 3

The membership of the Leading Group is comprised of five institutions including the Provincial Bureau of SMEs, the provincial Development and

Reform Committee, the provincial Agency for Environmental Protection, the provincial Bureau for Science and Technology and the provincial Economic Committee.

Clause 4

The Leading Group shall have 8 delegates from the above-mentioned five member institutions.

Clause 5

The delegates, to be nominated by the chief official of each of the member organizations and assigned based on the consultation by the leading group of each of the members respectively, shall serve a term of three years. If any member organization wishes to renew its delegate to the committee, a written application for the renewal should be submitted to the office of the Leading Group for approval. A nominee could not be a former delicate of the Leading Group unless he has got the approval.

Clause 6

The Leading Group will instate one Honorary Director, one Director and five deputy directors. An Executive Vice-Governor of Shanxi Government shall take the post of Honorary Director, the Director of the provincial Bureau of SMEs shall take the post of Director, and the five deputy directors of the Leading Group shall be taken by deputy directors one each of the above-mentioned five member institutions. The Deputy Director can act as Director in his absence. In addition to the normal duties and obligations of a member of the Leading Group, the Director (or acting Director) chairs meetings of the Leading Group, signs Minutes and formal correspondence on behalf of the Leading Group.

Clause 7

The Leading Group establishes an office to be in charge of handling routine activities and communications with the PIC and the project management

office of the UNDP/GEF Chinese TVEs Project. The office is responsible for compiling and circulating newsletters and implementing instructions of the PIC, and is established within the Industrial Guidance Division of the Provincial Bureau of SMEs.

Clause 8

The office staff consists of local policy experts, a division chief of the SME Bureau and two support staffs.

Functions of the Leading Group

Clause 9 Main responsibilities of the Leading Group is, under the guidance and with the coordination of the national PIC and the national project management office, to promote the waste heat power generation technology onto the "clean type" coking ovens within coking TVEs, and take every means to assist in removing barriers encountered by the TVEs to policy enforcement, product marketing, technology introduction and project financing for energy efficiency. The detailed responsibilities include the following.

1. Develop and implement action plan aimed at promoting regulatory reform related to the monitoring of energy efficiency at coking TVEs in the province, and transforming technology dissemination and project implementation for energy efficient into a market-oriented mechanism.
2. Oversee and monitor TVEs to implement the VA
3. Provide TVEs with information regarding latest technologies, industrial policies and management related to energy efficiency; organize communications between the pilot TVEs and non-pilot TVEs.
4. Promote the enforcement of national and local policies, regulations and standards related to energy efficiency within coking TVEs in the province.
5. Establish and implement an effective and incentive mechanism for

energy efficiency for and within coking TVEs.

Clause 10 Responsibilities of member organizations

1. The SME Bureau shall be responsible to the PIC and for coordinating with the PIC.
2. The provincial Development and Reform Committee shall be responsible for the examination and approval of project related to applying waste heat power generation technology onto "clean type" coking ovens, and assist the provincial Bureau for Science and Technology in evaluating and appraising the comprehensive performance of the "clean type" coking ovens and waste heat power generation plants.
3. The provincial Environmental Protection Agency assumes the responsibility of monitoring pollutant emissions from the ovens and plants and giving instructions to make TVEs reach standards concerned.
4. The provincial Bureau for Science and Technology is in charge of taking comprehensive evaluation and technical appraisal of the waste heat power generation system of the pilot TVE .
5. The Economic Committee shall be responsible for overseeing the general development of the "clean type" coking ovens and replicating the VA system within coking TVES. Working Procedures

Clause 11

The Leading Group operates by means of meetings, once half a year. The Director will chair the meetings. A meeting will be considered duly valid if more than 50% of its members are present, and minutes or documentations should be made accordingly.

Clause 12

The Leading Group Director may call interim meetings as per the request of PIC and the PMO. Minutes or documentations should be made

accordingly.

Clause 13

Minutes of meetings and progress reports will be submitted, by means of telephone or e-mail, to the national PIC and the project management office on a regular basis.

Supplementary Articles

Clause 14 This statute will become effective on the date after it is discussed and approved by all Leading Group members. The Leading Group reserves the right for the explanation of this statute.

Annex11. 3.2:

Action Plan of The Leading Group for Energy Efficiency and GHG Emissions Reduction at TVEs in Shanxi Province

1. Background

Coking sub-sector is one of the top energy consumers and heavy environmental polluters in all industries in China. Shanxi Province's coke output accounts for a half of the total in China. Of which, over one third is from township and village owned enterprises (hereafter TVEs). According to the subcontract entitled "Establishment and Capacity Building of Local Policy Implementation Committees" (Phase II) under the UNDP/GEF project of "Energy Conservation & GHG Emission Reduction in Chinese TVEs", the Leading Group for energy Efficiency and GHG Emissions Reduction at TVEs (hereafter the Leading group) in Shanxi Province will act to help pilot coking TVEs, during the implementation of their projects to build waste heat power generation plants, to get over barriers to the product marketing, policy implementing, technology adopting and funding related to projects for energy efficiency, and disseminate their best practice and experiences to other TVEs all over the province. An action plan is, there fore, developed to ensure the successful implementation of the Project.

II. Obstacles to the construction of co-generation plants

For the coking TVEs, market, policy, technical and financial obstacles to the construction of co-generation plants are mainly as the following:

1) There is a policy orientation for some certain coking technologies due to impercipient from governmental authorities concerned thus making it unpropitious for the dissemination of latest technologies.
2) Given the large amount of funding needed for the project, it is difficult for TVEs to get credit guarantees. This has become a crucial issue to the success of the project.
3) Due to the severe situation of power supply all over China, the soaring price and delayed date of supply keep the project progress putting off and off.
4) The official purchase price for power generated through co-generation is too low thus affecting the initiative of the providers and making it difficult to recover the investment.
5) Low education and poor technical level of the operator obstacle the TVEs from improving their management and introducing advanced technology and equipment.

3. Objectives (2004-2008)

1) Short term objectives (September 2004 – December 2005)
   (1) VAs reached and signed with the TVEs
   (2) Design and engineering drawings of the project completed and equipment ordered by November 2004
   (3) Conduct engineering construction of the waste heat power generation plants in participating TVEs
   (4) Equipment installed and tested by March 2005
   (5) The power plants to be put into operation after commissioning by the end of June 2005. Comparing with the baseline for energy efficiency (2004), power regeneration in the plants should reach 228 GWh, or save energy by 89,000 tce per annual.

2) Medium and long term objectives (2006 – 208)

   (1) The best practices, successful experiences and advanced management of the pilot TVEs should be disseminated within all "clean type" coking enterprises in Shanxi Province starting from 2007; and
   (2) The best practices and successful experiences for energy efficiency and GHG emissions reduction of coking TVEs in Shanxi should be disseminated within all coking TVEs in China starting from 2008.

4. Implementing Plan

1) Sign EE Voluntary Agreement between local governmental authorities and pilot TVEs

Timing: October 2004 —December 2005

Objective: The local government signs Energy Efficiency Voluntary Agreement with pilot TVEs thereby mobilizing enthusiasm of the TVEs, helping them remove the barriers to energy efficiency and building a sound foundation for the dissemination of the co-generation technology.

Activities:

(1) Consult with the TVEs and develop an engineering plan for the co-generation plant.
(2) Identify barriers to the implementation of the plan and develop measures to tackle them.
(3) Based on consultation with local government, the Leading Group develops incentive policy;
(4) Draft and sign Energy Efficiency Voluntary Agreement with the pilot TVEs;
(5) Consult with Hongyuan Company and RCF and provide the TVEs with technical and financial support;
(6) Summarize experiences accumulated in VA development and make preparation

for disseminating them all over the province.

2. Workshop on co-generation technology

Timing: December 2004
Objectives: Assist participants of the workshop to gain insight of coking development trends in both local and abroad, better understanding of the co-generation technology and solicit their support to the TVEs for energy efficiency.
Activities:
(1) Organize local technical experts, governmental officials from NDRC, SEPA, power plants/companies and banks at national and local level, and coking TVEs entrepreneurs and equipment providers to participate the workshop.
(2) Invite international experts to present the workshop with the latest development of coking technology and the importance of co-generation to the environmental protection.
(3) Organize deliberation/ discussion at the workshop.

3. Facilitate the collaboration agreement between the bank and the TVEs
Timing: December 2004
Objectives: Assist the TVEs in soliciting funding for their co-generation project
Activities:
(1) Facilitate TVEs to make feasibility study and prepare bankable proposals for their project.
(2) Create a good atmosphere and facilitate the collaboration between the bank and the TVEs by bringing advantages of the GEF project into play.
(3) Facilitate the signing of a funding agreement between the bank and TVEs.
(4)

4. Study tour and investigation between TVEs
Timing: April 2005
Objectives: By organizing study tours to the pilot coking TVEs, facilitate TVE entrepreneurs to learn further the co-generation technology and its importance to TVE's development, and make preparation for them to sign VA with the Leading Group and develop their own co-generation project.
Activities:
(1) Organize study tours to the pilot TVEs for other coking TVEs with "clean type" coking ovens;
(2) Introduce, by the pilot TVEs, co-generation technology and its construction requirements to visitors;
(3) Organize discussions

5. Technical trainings
Timing: March 2005
Objectives: Train key operators to reach essentially technical requirement for operating the co-generation equipment/plant, facilitate TVE management gain in sight of clean production, and get ready for pilot TVEs to reach standard all around for energy efficiency and environmental protection.
Activities:

(1) Select and assign key technicians of the pilot TVEs to be trained at large scaled power plants.
(2) Organize, by the Leading Group, environmental protection experts to deliver trainings on clean production at coking plants and co-generation plants for the pilot TVEs.
(3) Facilitate the pilot TVEs to plan their clean production program.

6. Facilitate TVEs to reach an agreement on power connection to the grid with power authority

Timing: June 2005
Objectives: Reach an agreement on power connection to the grid between power authority and TVEs
Activities:

(1) Learn national incentive policies on comprehensive utilization of energy/resources by visiting governmental authorities concerned;
(2) Assist TVEs in negotiating price of power supplying/connecting to the grid with power authorities concerned and solicit support from the authorities;
(3) Facilitate the signing of a collaboration agreement between the authority and the TVEs regarding the supply and connection of power from co-generation plants to the public grid.

Annex 11.3.2.1:

Field Survey Report on Establishment of Leading Group for Promotion of Energy Efficiency and GHG Emissions Reduction in TVEs

In Shanxi Province

According to the subcontract entitled "Establishment and Capacity Building of Local Policy Implementation Committees" (Phase II) under the UNDP/GEF project of "Energy Conservation & GHG Emission Reduction in Chinese TVEs", a team, led by Ms. Wang Guiling, Deputy Director of the PMO, and consisted of experts and task members of the contractor, paid a field survey in Taiyuan, Gaoping and Qingxu County in Shanxi Province from august 18 to22, 2004. The aim for the survey is to facilitate the establishment of Policy Implementation Committee of Shanxi Township and Village Coking Sector, or the Leading Group for Promotion of Energy Efficiency and GHG Emissions Reduction in TVEs in Shanxi Province (hereafter the Leading Group) and its capacity building, the Leading Group in Shanxi Province will act to help pilot coking TVEs, during the implementation of their projects to build waste heat power generation plants, to remove barriers to the product marketing, policy implementing, technology adopting and funding related to projects for energy efficiency, and disseminate their best practice and experiences to other TVEs all over the province.

During the survey, investigation conducted by the team covering the following items:

- Reform of coking sector at both provincial, and local (county or municipal) levels in Shanxi province;
- Operation, performance related to environmental protection of the "clean type" coking ovens;
- Application of co-generation technology onto the "clean type" ovens;
- Possibility to establish the LEADING GROUP within the provincial TVE/SME bureau.

Dr. Zhihong Zhang, the project CTA, was invited to take part in the team to assure the success of the survey.

Findings of the survey are as below:

1. The reform of coking sector in Shanxi Province

Coking sector is one of the backbone industries in Shanxi Province that has been emerging in the recent years due to the soaring price of cokes abroad. A great number of coking ovens are not equipped with facilities for either environmental protection or

by-product recovery. As a result, this caused severe environmental pollution and resources waste. In this connection, the provincial government launches a program to further reform the coking sector by updating production equipment and strictly controlling environmental pollution. To ensure the success of the program, the government developed approaches, in accordance with the national laws and regulations regarding environmental protection and coking sector. That are: " strictly control the whole production and environmental pollution; protect the resources; promote large scaled production lines while eliminate the small sized ones; promote the updated technology and renovate the outdated ones; extend the production from preliminary products into downstream processing; develop new coking technology and eliminate the backward production technologies". The detail measures including 1) to close down all indigenous and improved indigenous coking ovens; 2) investigate and identify small-scaled mechanical coking ovens that are not in line with the national policy or regulations, and issue a deadline to eliminate them; wind up those large-scaled mechanical coking ovens that are not legally certified by governmental authorities and re-examine the performance of those certified large-scaled mechanical ovens and define more strict environmental control standards; develop and accredit various types of "clean type" coking oven by attesting strictly their performance related to economical efficiency and pollutants emissions thereby promoting the application of the "clean type" coking oven all over the province during the coking sector reform; 5) strengthen the environment control by taking every means and to promote the clean production in the coking sector.

Through over one year's working, the reform has achieved a preliminary result. Levels regarding the technical, management and economical efficiency have risen considerably. The improvement including mainly as the following:

- Types of the oven updated. Based on the statistics, there are a total of 709 indigenous ovens, 628 improved indigenous ovens and 354 small-scaled mechanical ovens closed down, while a batch of key coking enterprises have expanded their production with large-scaled mechanical ovens, and some "clean type" ovens, represented by QRD-2000 Type coking oven, have been erected and put into operation by the end of 2003. Coke produced with large-scaled mechanical ovens accounts for 66.4% of the total output of coking TVEs increased by 30% comparing with the figure one year ago, while the output by improved indigenous ovens account for 28% of the total decreased by 35%. In the meantime, output by "clean type" ovens increased significantly and account for 5.5% of the total.
- Staffing restructured. Since the operation of advanced production equipment requires a higher technical level of the operator and more skilled technicians, percentage of technicians increased considerably as more and more large-scaled mechanical ovens and the "clean type"

ovens have been applied. According to an investigation, the percentage of technicians has increased from 8.61% in 2002 to 9.96% in 2003.

- Production enlarged. The number of coking enterprises decreased from 1,276 in 1995 to 589 in 2003, but the output of coke increased from 20.5 million tons in 1995 to 60 million tons in 2003. It is found out that the coking enterprises with an annual capacity of over 100,000 tons increased from 7.9% in 1995 to 33.9% in 2003.
- Energy efficiency improved. In 2000, coking enterprises with a rate of coal consumption per ton of coke was between 1.4 – 1.6 accounted for 31.1%, and in 2003, enterprises with a rate lower than 1.4 accounted for 60.6%. Eventually, within the investigated TVEs, a percentage of over 11.8% of them with a rate lower than 1.3.

2. The feasibility of the LEADING GROUP

It was found out by the team that the enforcement of national industrial policies has generated positive impacts on the coking sector in Shanxi Province and caused significant improvement in the coking sector. A batch of key coking enterprises has begun to renovate and expand their large-scaled mechanical ovens, and some enterprises developed new coking technologies based on the local conditions. The "clean type" oven, represented by QRD-2000 Type oven, has been introduced and put into operation in the enterprises thereby bringing a new way for energy efficiency and environmental protection. As the introduction of the "clean type" oven, its predominant performance on waste heat recovery and environment control has caused attention by the provincial government. It is still a new issue in China to apply co-generation technology onto the coking ovens, and, therefore, will meet a challenge of whether it could be accepted by the market, coking enterprises and in line with the current industrial policies.

As one of the largest coking provinces in China, coke output by coking TVEs accounts for two third of the total. Given the reform led by the provincial government is a consolidating program and needs a close cooperation between each governmental authority. In this connection, to establish the THE LEADING GROUP within the Provincial TVE/SME bureau with an effective operation mechanism will be of great advantage to following out the provincial government's guideline, promoting efficiently the co-generation technology onto the "clean type" oven as well as the clean production system and overcoming hurdles to product marketing, technology introducing, information disseminating and project financing for energy efficiency all over the province. In addition, this will also be propitious to the integration between the concept of THE LEADING GROUP and the government's reform strategy in coking sector. We believe that it will be a meaningful breakthrough on the concept of administrative region of THE LEADING GROUP establishment, and it will definitely generate positive results in the aspects of updating coking technology and strengthening environmental control.

3. Performance of the "clean type" oven related to energy efficiency and environmental control

The team further investigated the performance of the "clean type" oven related to energy efficiency and environmental control. In the Table 1 below, it compares performances of the QRD-2000 type oven with the large-scaled mechanical oven and the improved indigenous oven.

Table 1.

Oven Type	Coal consumption/1ton of coke	Electricity consumption/1ton of coke	Recovery of by-products
Large-scaled mechanical oven	1.28	73	Coal gas, crude benzene
"Clean type"	1.32	62	Co-generation with waste heat
Improved indigenous	1.40		None

The "clean type" QRD—2000 oven is a new innovative type of coking oven developed based on a non-recovery type of oven. It is featured with plankers and half-shut oven ports for coal charging, coke horizontally discharging, negative pressure within the coking chambers. These new technologies help to prevent emissions of raw gas and fly ashes from the oven thereby solving the environmental hazards caused. With these technologies, the period of time for coal charging and coke discharging can be saved significantly. As a result, it further prevents emissions of hazard pollutants from the oven. In addition, it also adopts a technology to horizontally collect coke discharged from the oven thereby preventing coke broken caused by falling down from the oven and the emissions. Details compare between each type of ovens see Table 2.

Table 2. Compare between each oven types Measurement: mg/m^3

	National standard	Improved indigenous oven	Large-scaled mechanical oven	QRD—2000 "clean type" oven
Particles	2.5	34-2500	445-6408	0.396-0.71
Soluble benzenes	0.60	208-214.5	132-2116	0.036-0.126

Benzopyrene	0.0025	0.204-5.615	0.425-42205	0.53-14.8*10-6
SO_2	400	30-271	0.155	52.4-139
NO_2	240	46.6-107.4	0.69	75
Fly ashes	250	471-2500	371-6000	40

By now, a design institute, entrusted the pilot coking TVEs, have developed engineering designs of co-generation plants for the "clean type" ovens. The design will make co-generation by using waste heat from the gas exhausted by the oven. After the co-generation, the used gas will be de-dusted and de-sulfurized and then released into atmosphere through a 60 meters high chimney. The rate of de-sulfurization is over 90%, and de-dust rate is over 95%.

4. Ownership of TVEs equipped with "clean type" ovens

All TVEs equipped with "clean type" ovens are developed based on their improved indigenous ovens. They experienced the development of indigenous ovens and improved indigenous ovens. After years' operation, they have principally completed their primitive accumulation and developed their own ways of business management and operation together with own product marketing channels, and have occupied a certain share on the market. Originally, all capital of the TVEs was solely owned by the collective. And as the deepening reform of the economical structure and the TVE's ownership, the widening of channels for TVEs' funding and the expanding of their business scale, the capital composition of the TVEs becomes diversified. Table 3 below shows the capital composition of the 8 TVEs equipped with "clean type" ovens.

Table 3. Capital composition of TVEs equipped with "clean type" ovens

Measurement: ¥100 Million RMB

	Total capital	Capital of collective	Capital of private	Foreign investment	Capital of the legal person
Gangyuan Coking Co. Ltd.	1.8	--	1.4	--	0.4
Xinggao Coking Co. Ltd.	2.7	--	2.1	--	0.6
Taiyuan Wanguang Coal Coking Co. Ltd.	1.5	--	0.9	--	0.6
Jiexiu Luxin Coal Gasification Co. Ltd.	3.3	--	2.4	--	0.9
Jiaocheng Jinyang Coal Coking Group	1.35	--	0.6	0.25	0.5

Lvliang Welfare Coking Plant	1. 4	1. 0	0. 14	–	0. 26
Longquan Foundry Coke Co. Ltd.	1. 2	–	0. 6	–	0. 6
Wenfeng Coal Coking Co. Ltd.	4. 5	–	3. 7	–	0. 8
Total	17. 75	1	11. 84	0. 25	4. 66

The continuing development of TVE's ownership reform increases their vitality. It makes TVEs enjoy their own power in technology updating and new product development. As a result, their adaptability of product marketing and capacity for funding have improved significantly, all these greatly protected investors' benefits.

5. The pilot TVEs

5.1 Taiyuan Gangyuan Coking Co. Ltd.

Established in 2000, Taiyuan Gangyuan Coking Co. Ltd. It is located at Qingxu County, Shanxi Province. It has fixed assets of ￥180 million RMB, occupies 450 mu (1 mu equals 666 M2) of land including 6,000 M2 of construction areas. It registers a turnover of ￥120 million RMB in 2003, and rated as AAA in credit by Shanxi Branch of the Agricultural Bank of China. The company has 496 employees including 22 managing staff accounting for 0.5% of the total, 41 technicians accounting for 10% of the total. Of which, 15 are with a diploma at over medium level in technology accounting for 6% of the total.

It has a QRD-2000 type of coking oven with an annual capacity of 400,000 tons of coke. The main products of the company include first grade metallurgical coke and 120,000 tons of refined coal. Their products are mainly exported to Japan, India, Brazil, while the rest products are sold to local consumers.

5.2 Xinggao Coking Co. Ltd.

Located in Gaoping City, Shanxi Province, the company was established in 1996. It has been granted a title of "Demonstration Enterprise for Environmental Protection" by SEPA. It has fixed asset of ￥200 million RMB and total capital of ￥270 million RMB. It occupies 270 mu of land including 105,000 M^2 of construction areas. It registers a turnover of ￥41 million RMB in 2003 (since its putting into operation in Agugst), and rated as AAA in credit by Shanxi Branch of the Agricultural Bank of China. The company has 471 employees including 32 managing staff accounting for 6.8 % of the total, 28 technicians accounting for 5.9 % of the total. Of which, 18 are with a diploma at over medium level in technology accounting for 3.8 % of the total.

The company has a QRD-2000 type of coking oven with an annual capacity of 400,000 tons of coke. The main products of the company include first grade metallurgical coke and second grade foundry coke which are mainly soled to local consumers in 16 provinces in China. Their products are much sought after for their high quality.

6. Technical support institutions in relevant to the "clean type" coking ovens

In order to promote the "clean type" coking oven, the team investigated situations of technical support institutions concerned. Based on the investigation, there are some qualified institutions in Shanxi Province including Shanxi Design Institute of Chemical Engineering. Established in ___, the institute is with national grade A certificate for chemical designing. Its business scope covers designs for chemical engineering, geo-exploration, fuel gas engineering and construction, coking engineering and pressure vessels, and environmental impact evaluation as well. The QRD-2000 Type coking oven is developed by the institute. And the co-generation plant designed by the institute for the "clean type" coking oven has justified by an experts group.

Another design institute is No.2 Design Institute of Chemical Engineering. Established in 1958, the institute is located in Taiyuan City. As a professional academy, it is specially engaged in providing comprehensive services in areas of engineering design and contract. With national grade A certificates for making engineering design, providing engineering consultation and supervising construction projects, it is experienced in making designs for petrochemical industry, organic chemical industry, inorganic chemical industry, coal processing industry and environmental protection. Furthermore, it has also been granted a UKAS certificate by ISO.

7. Industrial policy in coking sector

7.1 The Catalogue of Elimination of Heavy-Polluting Technologies and Equipment (the First Series) (Guo Jing Mao Zi, No. [1997] 367)

The Catalogue was jointly enacted by State Economic and Trade Committee, National Environmental Protection Agency and former Ministry of Machinery on June 5, 1997. In the list of "Elimination of Heavy-polluting Technologies and Equipments", the first item is "75 and 89 type modified indigenous coke oven", shutdown deadline of which is the end of 1999. At the same time, the production scale for coke making plants must be larger than 200 thousand tons of coke and the height of battery higher than 2.8 meter.

7.2 The Catalogue of Elimination of Less Advanced Production Capacity, Technology and Products (the Second Series).

Called the 16th Order, the Catalogue was issued by State Economic and Trade Committee on December 31, 1999. The Catalogue covers 8 industries including iron and steel, non-ferrous metal and light industry, 119 items in which indigenous (incl. modified indigenous) coke making technology was ordered to eliminate by the end of 2000.

7.3 Notices on the Release of the Second Series of National Key Technical Renovation Projects

In this Notice, the "clean type" coking oven, with an annual capacity of 400,000 tons, was listed.

7.4 Implementation Measures of Industrial Restructuring in Shanxi Province (Jin Zheng Fa No. [2003] 28)

It is stated in the decree that "the coke output must be controlled under 65 million thousand tons by 2005, total volume of pollutants discharged by coke making shall be reduced by 40% compared with 2002", "All the less backward coke ovens (including Red flag series, 70 type, 66 type series and modified indigenous coke oven) that don't accord with the national industrial policy must be shut down unconditionally".

7.5 Guidelines for Upgrading and Renovation of Coke-making Sector, drafted by Shanxi TVE Bureau in 2000

The Guidelines was issued by Shanxi TVE Bureau. The Guidelines put forward that the battery of newly constructed coke ovens must be higher than 4 meter, the output of a single oven must reach 400 thousand tons, and facilities for chemical products recovery and pollution treatment must be equipped onto the ovens.

7.6 Urgent Notice on Notions to Sort Out and Rectify the Coking Sector

The notice was issued by State Development and Reform committee in 2004. It further emphasized that the coking sector shall be sorted out and rectified all round to optimize its structure and minimize its environmental impacts. It also sited that "all coking production with indigenous coking ovens shall be shut off, and all the ovens shall be destroyed."

8. Main barriers to the promotion of co-generation technology onto "clean type" ovens

8.1 It was investigated that there are different opinions on promoting either large-scaled

mechanical ovens or the "clean type" coking ovens. One opinion is that

a) the production capacity of a "clean type" oven is smaller than that of a large-scaled mechanical oven; and

b) the most severe point is that the "clean type" oven can not be used to recover by-products since the coking process in the "clean type" oven is under the negative pressure. Therefore, it will cause wastes of raw materials.

While another opinion is that

a) since all operation of the "clean type" oven is under negative pressure, its harmful emissions are much lower than that form a mechanical oven;

b) all the waste gas and other volatile matter are burned and transformed into heat, and then electricity. This can be just considered as normal practice of generating electricity with coal. Therefore, nothing has been wasted;

c) using waste heat for power generation will reduce significantly the expensive investment of equipment to recover by-products and high cost for waste gas and water treatment.

In this connection, people who are with the second opinion insist to promote the "clean type" oven and its co-generation technology in coking production. But there exist some inappropriate inclines in industrial policies due to the one-sidedness of understanding hindered its promotion.

8.2 It is reported that to construct a co-generation plant onto a QRD-2000 "clean type" oven with a coking capacity of 400,000 tons will coat about ¥ 50 million RMB. Most of the investment will rely on loans from a bank, except a small amount that can be self financed by the coking enterprises. Given all the state-owned banks has been transformed into commercial banks, the most difficult barrier for them is to get guarantee for their funding, or loans. It has become a key issue for the promotion of the oven and the co-generation technology.

8.3 Due to the short supply of power since the latter half of the last year, the demands of power generators exceed the supply. It is reported that it will take 16- 20 months to purchase a set of turbo generator with a capacity of 6,000 kW, and its price is also doubled than that in the last year. In addition, there are also huddles in rail transport.

8.4 In most case, a coking enterprise only consumes about 15% of the power generated by their co-generation plant, while the rest, the 75% of the total, needs to be sold out by connecting with the public grids. But, up to now, it is not quite clear from the aspect of national policy in this regard; in particular the power authority always worries that the whole power supply through the grids will be affected by that generated by a co-generation facility when its quality is low. Therefore, the authority is not likely to allow the co-generation facility t o be connected with the grids. In addition, the purchase price of the co-generated power by the authority is low. It is

only about ¥ 0.25 RMB/kWh, while the selling price for the TVEs is ¥ 0.70 RMB/kWh. This is pessimistic for the TVEs to recover their investment.

8.5 The educational level of TVEs' workers is yet to be improved. It is investigated that the educational period of the most of TVEs' workers is at about 6-12 years, or at middle school level. This severely hurdles them from applying advanced equipment and the modern management system.

9. Conclusion and recommendations

9.1 The strategy on coking industry reform has gained positive achievements in Shanxi Province. With this strategy, the comprehensive capacity of Shanxi coking TVEs has improved significantly. It is feasible to establish the LEADING GROUP within Shanxi TVE/SME Bureau to promote co-generation technology onto the "clean type" coking ovens. During its capacity building, it can be propitious to the integration between the concept of the LEADING GROUP and the government's reform strategy in coking sector. It will be a meaningful breakthrough on the concept regarding administrative region to establish the LEADING GROUP, and will definitely generate positive results in the aspects of updating coking technology and strengthening environmental control.

9.2 The performance of the "clean type" oven has improved on that of the conventional mechanical oven. And, comparing with the improved indigenous oven, its energy efficiency is much higher. It can process high quality coke while consumes less prime coking coal. Furthermore, its waste heat can be recovered for co-generation. The new technology provides an innovative way to meet the raising standards for environmental control and the development of coking industry.

9.3 It is recommended to invite foreign coking experts to participate the workshop on co-generation organized under the project thereby assisting the participants gain insights of the new development of coking technology of both local and abroad.

9.4 To organize a study tour for local entrepreneurs to USA or European countries to learn coking and co-generation technologies abroad thereby increase the energy efficiency of the local "clean type" ovens.

9.5 The project replication in coking sector can be conducted in two ways. In the province, we should to promote the application of co-generation technology onto the "clean type" ovens. In other provinces, t o promote both the "clean type" oven and the co-generation technology.

9.6 To facilitate the funding for TVEs. We should apply all around the advantages of the GEF project on coordinating between the bank and TVEs, building a good atmosphere of the collaboration between the bank and TVEs and facilitating them to reach loan agreements. In the meantime, we should also solicit foreign investors to participate in the project.

Annex11.3.3.1:

Energy Efficiency Voluntary Agreement

BETWEEN

Bureau of minority business enterprise in Shanxi Province
(Hereinafter referred to the Office)

AND

Gangyuan Coke Company in Taiyuan City, Shanxi Province
(Hereinafter referred to the Demonstration Enterprise)

1. Background

1.1 Energy Efficiency Voluntary Agreement is an agreement that is entered voluntarily by and between a trade organization or individual enterprise and the government in order to improve energy efficiency and reduce greenhouse gas emissions. Industry organizations or enterprises commit to meet the target of energy efficiency or GHG emission reduction, and the government provides preferential policies and/or other incentives to the industry organizations and the enterprises.

1.2 The Project of "Energy Conservation and Greenhouse Gas (GHG) Emissions Reduction in Chinese Township and Village Enterprises ("TVEs") – Phase II, sponsored by the GEF, was implemented by the United Nations Development Program (UNDP), and executed by the Untied Nations Industrial Development Organization (UNIDO) and Ministry of Agriculture (MOA) of the People's Republic of China. The purpose of the Project is to help Chinese township enterprises to adopt efficient energy conservation technologies and reduce the greenhouse gas emission from brick industry, cement industry, casting industry, and coke industry in China.

1.3 In order to formulate and implement action plans to promote regulatory reforms and commercialization of energy efficiency technologies and projects among TVEs, the Energy Conservation Voluntary Agreement is formulated so as to improve energy efficiency, reduce greenhouse gas emissions and carry out the national "medium-and-long-term special energy efficiency layout" in respect of generalization of the spirit of Energy Conservation Voluntary Agreement.

2. Targets of Energy Conservation

2.1 Through the Voluntary Agreement implement, the Government shall fulfill the transformation of governmental function and explore a new mechanism aimed to achieve the same energy conservation goal but without compulsory commands. Furthermore, the Demonstration Enterprise shall reduce production cost, improve product quality, protect environment, and thus, establish a better public image for the enterprise.

2.2 The Demonstration Enterprise establishes voluntarily the following direct Energy Efficiency targets: based on 2004 (reference year), by 31st December 2005, the Demonstration Enterprise shall complete the project of waste heat power plant, the plant will have a power generation capacity of 108 million kWh per annual, As a result, this will reduce 43,200 tons of tce.

2.3 Because the government adopts stricter environmental standard and more energy is consumed, the targets shall be adjusted if the conditions occur.

3. Measures for Energy Conservation

3.1 In order to fulfill the target of Energy Conservation on time, the Demonstration Enterprise shall establish a concrete Energy Conservation Plan, which shall be reviewed and approved by the Office, and implement the plan carefully.

3.2 The Demonstration Enterprise shall enhance the energy management, establish energy management system and energy efficiency standards, improve the internal regulations, assign full-time energy manager to be responsible for the energy management, improve employee's consciousness of energy conservation.

4. Preferential Policies

4.1. Depreciation acceleration can be applied to the equipment in the Clean Production List. Energy audit and training expense for the Energy Conservation Project can be included in the management cost. The proportional limit of cost of R&D on energy conservation can be increased and included in the management cost.

4.2. The Office committed to assist the Demonstration Enterprise in solving financing problems such as financing difficulties through the governmental credit system for medium- and small-scale enterprises and to recommend the Demonstration Enterprise to apply for recycling fund loan and other commercial loans, which will be used in the energy conservation project.

4.3. After the Demonstration Enterprise signs the Voluntary Agreement, the Office shall promise to recommend for the pilot program as well as award the honorable title to the Demonstration while introducing and extending the experience of the Demonstration Enterprise in the pilot on media.

5. Monitoring and Assessment

5.1 The Office shall submit an Annual Report on implementation of the Voluntary Agreement to the PIC in the first quarter of the year and receive the instruction from the PIC.

5.2 The Demonstration Enterprise agrees to receive assessment of the effect of the Voluntary Agreement implementation by a Technical Team established by an independent third party.

5.3 In the valid period of the agreement, the Demonstration Enterprise shall submit an annual Supervision Report to the Office and the Technical Team in written form in the first quarter every year, and submit the final report in the first quarter in the next year after the Agreement ends. The report shall include: production statistics, energy consumption data, status of implementation of Energy Conservation Plan and Energy Conservation Project, effect of energy conservation, problems and barriers, plan for the next year, measure adjustment, experiences and lessons, and suggestion for perfecting the Voluntary Agreement.

5.4 The Technical Team is responsible for evaluation in the implementation of the agreement, including the evaluation of the Energy Conservation Plan, Annual Monitoring Reports, the Interim Report, and the Final Report submitted by the Demonstration Enterprise. The Technical Team shall inform the assessment result in writing to the Office and the Demonstration Enterprise. The assessment report shall cover evaluated comments on the authenticity of data, the Energy Conservation Plan and projects of the Demonstration Enterprise, the status to meet the targets, and the suggestion on Agreement modification.

5.5 If the Evaluation Report indicates that the Demonstration Enterprise failed to meet the requirement that the Agreement defines, the Demonstration Enterprise shall adopt measures including identifying problems, seeking new energy conservation measures, improving the energy conservation efforts in the next year, modifying energy conservation plan, based on the advice from the Technical Team.

6. Modifications and Termination

The agreement shall be modified or terminated if the following conditions occur:

- ✧ The Laws, Regulations, or policies related to energy or environmental protection have big changes compared with the year when the agreement is signed.
- ✧ Implementation of the Agreement has negative impact to the development or normal operation of the Demonstration.

The agreement shall come into force from the date it is signed and be invalid on 31st Dec, 2008. Any pending matters in the agreement shall be discussed jointly between parties and an additional agreement shall be entered and being equally valid.

Bureau of minority business enterprise in Shanxi Province (seal)	Gangyuan Coke Company in Taiyuan City, Shanxi Province (seal)
Authorized representative	Authorized representative
Date:	Date:

Appendix:

Gangyuan Coke Company

Energy Conservation Plan

1 Brief Introduction of the Enterprise

The Taiyuan Gangyuan Coke Company (hereafter the Company) is located in Qingxu County, Shanxi Province, set up in 2002. It occupies an area of over 450 *mu* (1 *mu* = 1/15 hectare).The Company's leading product is first-level metallurgical coke. The clean coke ovens with a capacity of 450,000 tons coke a year adopted by the Company are branded QRD-2000, with Q denoting clean (*qingjie*), R heat recovery (*rehuishou*), and D stamping (*daogu*).Technical renovation project of Phase I of the coke plant started in July 2002 and was completed in April 2003. Test production was carried out in July 2003, and the two batteries of coke ovens have been in normal operation since, with a capacity of 200,000 tons a year. Technical renovation project Phase II of the coke plant was completed in 2004. The project has a design capacity of 400,000 tons of coke output per year.

The technical process is:

Raw coal→Storing up→coking→coke quenching→Coke

2 Targets

The Demonstration Enterprise establishes voluntarily the following direct Energy Efficiency targets: based on 2004 (reference year), by 31st December 2005, the Demonstration Enterprise shall complete the project of waste heat power plant, the plant will have a power generation capacity of 108 million kWh per annual, As a result, this will reduce 43,200 tons of tce.

3 Measures for Energy Conservation

3.1 Energy Management

The Demonstration Enterprise shall enhance the energy management, establish and perfect energy management system and energy efficiency standards, and improve the internal regulations.

	Measures	Effect
1	Establish an Energy Management Department, and assign full-time staff responsible for the energy management of the Company.	Estimate increase energy conservation rate by 1%.
2	Formulate the energy plan, and compile monthly energy consumption table.	
3	Adopt energy consumption ration management	
4	Establish energy measuring and monitoring system.	

5	Provide training on energy conservation to employees in order to improve their awareness on energy conservation and GHG emission reduction.	

3.2 Common Energy Conservation Measures

	Measures	Effect
1	Use high efficiency lighting products.	Estimate increase energy conservation rate by 2%.
2	Reduce the energy consumption of transportation vehicles through rational arrangement.	
3	Use recycling office products.	
4	Use renewable energy technologies and products.	
5	Use energy-saving products, including office equipment.	
6	Adopt computer system to improve the efficiency of company management and the energy efficiency.	
7	Use electric motor with speed and frequency modulation	

3.3 Energy Conservation and Technical Innovation

In order to achieve the target of energy conservation on time, the Demonstration Enterprise shall adopt the following measures.

	Measures	Expected Energy Conservation (tce/a)	CO_2 Emission Reduction(t/a)	Time
1	The waste heat power plant consists of four waste heat boilers in intermediate temperature and pressure of 25t/h each. and three 6 MW condensed steam generators. The plant will have a power generation capacity of 108 million kWh per annual..	43, 200.00	107, 676.00	2004.1-2006.12

Basic Information of the Demonstration Enterprise

Name: The Taiyuan Gangyuan Coke Company							
Address: Donggaobai Village, Qingxu County, Shanxi Province						Zip: 030402	
Ownership: Private limited liability						Established in: 2000	
Contact: Ma Yong				Tel: 5993991		Fax: 5993991	
Information on Enterprises Quality							
Honors	Types	Name of Honors		Issued by		Date	
	Nation level					2003.8	
	Province level					2004.3	
Certifications	Type	Name		Validation date		Products	
	Quality Control System Certification	ISO9000					
Year		2002		2003		2004	
Product	Product type	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)
	Coke			128,000	16,000	260,000	260,000
Final total capital value(10k RMB)				29,831		38,000	
Work force(10k RMB)				418		468	
Floor area(m^2)				45		45	
Energy Consumption							
Year		2002		2003		2004	
Energy Consumption		Quantity	Coefficient	Quantity	Coefficient	Quantity	Coefficient
Coal (t)				197,884		474,525	
Fuel oil (t)				21.56		57.37	
Electricity (10k kWh)				75		200	

Annex11.3.3.2:

Energy Efficiency Voluntary Agreement

BETWEEN

Government of Gaoping City, Shanxi Province
(Hereinafter referred to the Government)

AND

Xinggao Coking Group Co. Ltd. in Gaoping City, Shanxi Province
(Hereinafter referred to the Demonstration Enterprise)

1. Background

1.1 Energy Efficiency Voluntary Agreement is an agreement that is entered voluntarily by and between a trade organization or individual enterprise and the government in order to improve energy efficiency and reduce greenhouse gas emissions. Industry organizations or enterprises commit to meet the target of energy efficiency or GHG emission reduction, and the government provides preferential policies and/or other incentives to the industry organizations and the enterprises.

1.2 The Project of "Energy Conservation and Greenhouse Gas (GHG) Emissions Reduction in Chinese Township and Village Enterprises ("TVEs") – Phase II, sponsored by the GEF, was implemented by the United Nations Development Program (UNDP), and executed by the Untied Nations Industrial Development Organization (UNIDO) and Ministry of Agriculture (MOA) of the People's Republic of China. The purpose of the Project is to help Chinese township enterprises to adopt efficient energy conservation technologies and reduce the greenhouse gas emission from brick industry, cement industry, casting industry, and coke industry in China.

1.3 In order to formulate and implement action plans to promote regulatory reforms and commercialization of energy efficiency technologies and projects among TVEs, the Energy Conservation Voluntary Agreement is formulated so as to improve energy efficiency, reduce greenhouse gas emissions and carry out the national "medium-and-long-term special energy efficiency layout" in respect of generalization of the spirit of Energy Conservation Voluntary Agreement.

2. Targets of Energy Conservation

2.1 Through the Voluntary Agreement implement, the Government shall fulfill the transformation of governmental function and explore a new mechanism aimed to achieve the same energy conservation goal but without compulsory commands. Furthermore, the Demonstration Enterprise shall reduce production cost, improve product quality, protect environment, and thus, establish a better public image for the enterprise.

2.2 The Demonstration Enterprise establishes voluntarily the following direct Energy Efficiency targets: based on 2004 (reference year), by 31st December 2005, the Demonstration Enterprise shall complete the project of waste heat power plant, the plant will have a power generation capacity of 120 million kWh per annual, As a result, this will reduce 46,000 tons of tce.

2.3 Because the government adopts stricter environmental standard and more energy is consumed, the targets shall be adjusted if the conditions occur.

3. Measures for Energy Conservation

3.1 In order to fulfill the target of Energy Conservation on time, the Demonstration Enterprise shall establish a concrete Energy Conservation Plan, which shall be reviewed and approved by the Government, and implement the

plan carefully.

3.2 The Demonstration Enterprise shall enhance the energy management, establish energy management system and energy efficiency standards, improve the internal regulations, assign full-time energy manager to be responsible for the energy management, improve employee's consciousness of energy conservation.

4. Preferential Policies

4.1. Depreciation acceleration can be applied to the equipment in the Clean Production List. Energy audit and training expense for the Energy Conservation Project can be included in the management cost. The proportional limit of cost of R&D on energy conservation can be increased and included in the management cost.

4.2. The Government committed to assist the Demonstration Enterprise in solving financing problems such as financing difficulties through the governmental credit system for medium- and small-scale enterprises and to recommend the Demonstration Enterprise to apply for recycling fund loan and other commercial loans, which will be used in the energy conservation project.

4.3. After the Demonstration Enterprise signs the Voluntary Agreement, the Government shall promise to recommend for the pilot program as well as award the honorable title to the Demonstration while introducing and extending the experience of the Demonstration Enterprise in the pilot on media.

5. Monitoring and Assessment

5.1 The Government shall submit an Annual Report on implementation of the Voluntary Agreement to the PIC in the first quarter of the year and receive the instruction from the PIC.

5.2 The Demonstration Enterprise agrees to receive assessment of the effect of the Voluntary Agreement implementation by a Technical Team established by an independent third party.

5.3 In the valid period of the agreement, the Demonstration Enterprise shall submit an annual Supervision Report to the Government and the Technical Team in written form in the first quarter every year, and submit the final report in the first quarter in the next year after the Agreement ends. The report shall include: production statistics, energy consumption data, status of implementation of Energy Conservation Plan and Energy Conservation Project, effect of energy conservation, problems and barriers, plan for the next year, measure adjustment, experiences and lessons, and suggestion for perfecting the Voluntary Agreement.

5.4 The Technical Team is responsible for evaluation in the implementation of the agreement, including the evaluation of the Energy Conservation Plan, Annual Monitoring Reports, the Interim Report, and the Final Report submitted by the Demonstration Enterprise. The Technical Team shall inform the assessment result in writing to the Government and the Demonstration Enterprise. The assessment report shall cover evaluated comments on the authenticity of data, the Energy Conservation Plan and projects of the Demonstration Enterprise, the status to meet the targets, and the suggestion on Agreement modification.

5.5 If the Evaluation Report indicates that the Demonstration Enterprise failed to meet the requirement that the Agreement defines, the Demonstration Enterprise shall adopt measures including identifying problems, seeking new energy conservation measures, improving the energy conservation efforts in the next year, modifying energy conservation plan, based on the advice from the Technical Team.

6. Modifications and Termination

The agreement shall be modified or terminated if the following conditions occur:

- ✧ The Laws, Regulations, or policies related to energy or environmental protection have big changes compared with the year when the agreement is signed.
- ✧ *Implementation of the Agreement* has negative impact to the development or normal operation of the Demonstration.

The agreement shall come into force from the date it is signed and be invalid on 31st Dec, 2008. Any pending matters in the agreement shall be discussed jointly between parties and an additional agreement shall be entered and being equally valid.

Government of Goping City, Shanxi Province (seal)	Xinggao Coking Group Co. Ltd., Gaoping City, Shanxi Province (seal)
Authorized representative	Authorized representative
Date:	Date:

Appendix:

Xinggao Coking Group Co. Ltd.

Energy Conservation Plan

1 Brief Introduction of the Enterprise

Xinggao Coking Group (hereafter the Group) is located in Gaoping, Shanxi Province, established in 1996. The Group is the first nongovernmental-business Coal blending and Coking enterprise central of anthracite in China.

Raw coal → Coal blending → Comminution → Mixing → Hydraulic tamping briquette → Coking → Extracting of coke → Coke quenching → Coke cooling → Sieving coke →Targets

2 Targets

The Demonstration Enterprise establishes voluntarily the following direct Energy Efficiency targets: based on 2004 (reference year), by 31st December 2005, the Demonstration Enterprise shall complete the project of waste heat power plant, the plant will have a power generation capacity of 120 million kWh per annual, As a result, this will reduce 46,000 tons of tce.

3 Measures for Energy Conservation

3.1 Energy Management

The Demonstration Enterprise shall enhance the energy management, establish and perfect energy management system and energy efficiency standards, and improve the internal regulations.

	Measures	Effect
1	Establish an Energy Management Department, and assign full-time staff responsible for the energy management of the Company.	Estimate increase energy conservation rate by 1%.
2	Formulate the energy plan, and compile monthly energy consumption table.	
3	Adopt energy consumption ration management	
4	Establish energy measuring and monitoring system.	
5	Provide training on energy conservation to employees in order to improve their awareness on energy conservation and GHG emission reduction.	

3.2 Common Energy Conservation Measures

	Measures	Effect
1	Use high efficiency lighting products.	Estimate increase energy conservation rate by 2%.
2	Reduce the energy consumption of transportation vehicles through rational arrangement.	
3	Use recycling office products.	
4	Use renewable energy technologies and products.	

5	Use energy-saving products, including office equipment.	
6	Adopt computer system to improve the efficiency of company management and the energy efficiency.	
7	Use electric motor with speed and frequency modulation	

3.3 Energy Conservation and Technical Innovation

In order to achieve the target of energy conservation on time, the Demonstration Enterprise shall adopt the following measures.

	Measures	Expected Energy Conservation (tce/a)	CO_2 Emission Reduction(t/a)	Time
1	The waste heat power plant consists of eight waste heat boilers of 20t/h each. and two 15 MW condensed steam generators. The plant will have a power generation capacity of 120 million kWh per annual..	46,000	120,000	2004.1-2005.12

Basic Information of the Demonstration Enterprise

Name: Xinggao Coking Group Co. Ltd.							
Address: Ma Village, Macun County, Gaoping City, Shanxi Province						Zip: 048400	
Ownership: Limited liability						Established in: 1996	
Contact: Hou Kang				Tel: 0356-5821282		Fax: 0356-5821278	
Information on Enterprises Quality							
Honors	Types	Name of Honors		Issued by		Date	
	Province level	Products of Trustworthy Quality		Bureau if Township Enterprise Management, Shanxi Province		1997.12	
Certifications	Type	Name		Validation date		Products	
	Quality Control System Certification	ISO9002-2000				Coke	
Year		2001		2002		2003	
Product	Product type	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)
	Coke	60000	1634.4	70000	1902.8	100000	2724
Final total capital value(10k RMB)		1704		8443		20012	
Work force(p)		130		147		230	
Floor area(m2)		34632		34632		194472	
Energy Consumption							
Year		2001		2002		2003	
Energy Consumption		Quantity	Coefficient	Quantity	Coefficient	Quantity	Coefficient
Coal (t)							
Electricity (10k kWh)		72		96		120	

Annex11.4.1:

Statute of Policy Implementation Committee, Tongxiang

General Provisions

Clause 1 Nature

Tongxiang Policy Implementation Committee (hereinafter referred to as the LPIC) is an institution under the leadership of Tongxiang municipal, which is established to assist the local cement sector in applying high efficient energy saving technology and tackling various barriers to the application.

Clause 2 Objectives

The objective of the LPIC is to disseminate energy efficient technology and introduce high efficient management system at TVEs to produce high quality and energy efficient cement thereby reducing energy consumption and GHG emissions and promoting the sustainable development of cement TVEs in Tongxiang.

Organization of the LPIC

Clause 3 The membership of the LPIC

The membership of the LPIC is comprised of eight parties including the municipal office, Bureau of Economic and Trade, Bureau of Science and Technology, Bureau of TVEs/SMEs, Tongxiang Environmental Protection Agency, Bureau of Finance, Bureau of National Tax, Bureau of Local Tax and Tongxiang Branch of ABC.

Clause 4 Delegation of the LPIC.

The LPIC shall have 8 delegates from the above-mentioned eight member

parties. Each of the delegates should be the director of each of the eight parties.

Clause 5 Terms of the delegates

The delegates, to be nominated by the municipal, shall serve a term of three years. If any member party wishes to renew its delegate to the committee. a written application for the renewal should be submitted to the office of the municipal for approval. A nominee could not be a former delegate of the LPIC unless he has got the approval.

Clause 6 Director of LPIC

The LPIC will instate one director and one executive deputy director. The vice mayor of the municipal shall take the post of Director, and the director of the Bureau of Economic and Trade shall be the executive deputy director of the LPIC. The Deputy Director can take care of routine matters as Director in his absence. In addition to the normal duties and obligations of a delegate of the LPIC, the Director (or acting Director) chairs meetings of the LPIC, signs Minutes and formal correspondence on behalf of the LPIC.

Clause 7 LPIC Office

Under the LPIC, an office is established to be in charge of handling routine matters and communications with the PIC and the project management office of the UNDP/GEF Chinese TVEs Project. The office is located in the office building of the municipal Bureau of Economic and Trade.

Clause 8 Staffing

The office staff consists of local policy experts, the other staffs of the Bureau of Economic and Trade.

Functions of the LPIC

Clause 9 Main responsibilities of the LPIC

Main responsibilities of the LPIC are, under the guidance and with the coordination of the national PIC and the national project management office,

to facilitate to remove barriers encountered by the local cement TVEs to policy enforcement. Detail responsibilities include the following.

1. Develop and implement action plan aimed at promoting regulatory reform related to the monitoring of energy efficiency at cement TVEs, and facilitation of the transform of the project implementation into a market-oriented mechanism.
2. Push forward TVEs to sign the VA with local government authorities.
3. Provide TVEs with information regarding latest technologies, industrial policies and management related to energy efficiency regularly;
4. Promote the enforcement of national and local policies, regulations and standards related to energy efficiency, technical renovation and environmental protection within cement sector in Tongxiang.
5. Establish and implement an effective and incentive mechanism for energy efficiency for and within local TVEs.
6. Recommend advanced TVEs and individuals in EE to the PIC for encourage and reward purpose.

Clause 10 Responsibilities of member parties

1. The municipal office, together with the Bureau of Economic and Trade should be responsible for coordination matters.
2. The Bureau of Economic and Trade and Bureau of Science and Technology should be responsible for providing instructions to the cement sector in technical renovation for EE.
3. The municipal Bureau of Finance, Bureau of National Tax and Bureau of Local Tax shall be responsible for providing instruction and support to local TVEs in regards of financial and taxation matters.
4. The municipal Environmental Protection Agency assumes the responsibility of providing advises on policy enforcement related to environmental protection, EE and pollutant/emissions quota distribution

and conduct "environmental impact assessment" in the sector.

5. The Tongxiang Branch of ABC should be responsible for providing advice to TVEs in regards of financial matters.

Working Procedures

Clause 11 working forms

The LPIC operates by means of meetings, once half a year. The Director, or the executive deputy director at the director's absent, will chair the meetings. A meeting will be considered duly valid if more than 50% of its members are present.

Clause 12 Interim meetings

The LPIC Director may call interim meetings as per the request of PIC and the PMO.

Clause 13 Reporting system

Minutes of meetings and progress reports will be submitted, by means of telephone or e-mail, to the national PIC and the project management office on a regular basis.

Supplementary Articles

Clause 14 This statute will become effective on the date after it is discussed and approved by all LPIC members. The LPIC reserves the right for the explanation of this statute.

Annex11.4.2:

LPLC Action Plan in Tongxiang, Zhejiang Province

1. Background

Funded by the Global Environmental Facilities (GEF), the objective of the UNIDO project namely "Energy Conservation & GHG Emission Reduction in Chinese TVEs, Phase II" is to reduce greenhouse gas emissions from the Chinese township and village enterprises (TVEs) in cement, brick making, coking and metal casting sectors by means of facilitating them to update their production technologies for energy efficiency (EE).

Under the project Phase I, it was identified key policy, market, technology, and financial barriers to the adoption of energy efficient technologies in the brick, cement, metal casting, and coke-making sectors, and proposed strategies to remove them accordingly. In the project Phase II, it is projected to establish local Policy Implementation Committee (hereafter LPIC) as a mechanism for the removal of policy barriers, and adopts a market transformation approach to promoting EE in Chinese TVEs.

To establish LPIC is an essential task of the project, it will play a significant role in facilitating to create a fine policy environment for the pilot TVEs and the whole cement sector. It will also facilitate to strengthen the enforcement of industrial policies and to develop incentive policies for EE. An action plan of the LPIC is therefore developed.

II. Obstacles to cement sector in Tongxiang

There are various obstacles to technical renovation for EE in cement sector in Tongxiang. It is mainly as the following.

1. Resources: It is difficult for cement producers to get supply of power, coal and limestone, etc.
2. Technology: There is lack of skilled professionals and technicians;
3. Funding: There is only a unitary system of financing, and it is difficult for TVEs to get access to financing.
4. Policy: Sometimes, the preferential treatment, tax deduction and drawback, under the policy related to the support of comprehensive use of resources can not be carried out.

3. Objectives（2004-2008）

3.1 Short term objectives (2004 – December 2005)

(1) VA reached and signed between the local government and the pilot

(2) The pilot conducts technical renovation for EE. Comparing with the baseline for energy efficiency (2003), its comprehensive energy consumption for cement production should drop by 10% by the end of 2005.

(3) Primarily establish an effective mechanism, i.e. Voluntary Agreement for EE thereby laying a sound foundation for EE replication.

3.2 Medium and long term objectives (2004 – 208)

(1) All projected goals for EE and environmental protection in the pilot TVEs reached by the end of 2008. Comparing with the baseline for energy efficiency (2003), its comprehensive energy consumption for cement production should drop by 15% by the end of 2008;

(2) The best practices and successful experiences of the pilot TVEs are disseminated in the whole sector in Tongxiang, and a sustainable and self-improving VA mechanism is well established under the market-oriented economic system.

4. Action Plan

4.1 Sign EE Voluntary Agreement between local governmental authorities and the pilot TVE, Shenhe Cement Co. Ltd.

Timing: August 2004 —December 2005

Objective: The local governmental authority signs Energy Efficiency Voluntary Agreement with the pilot TVE. Comparing with the baseline for energy efficiency (2003), its comprehensive energy consumption for cement production should drop by 10% and 15% by the end of 2005 and 2008 respectively.

Activities:

(1) Consult with the local authorities and develop incentive policies for EE;

(2) Draft VA together with the pilot;

(3) Consult with Hongyuan Company and RCF and provide the TVEs with technical and financial support;

(4) VA signed (See the VA for its detail);

(5) Assign, based on an agreement reached by parties concerned, a third party to

monitor the implementation of the VA in accordance with the VA;

(6) Summarize experiences accumulated in VA implementation and make preparation for its dissemination in the sector in Tongxiang.

4.2 Facilitate the collaboration agreement between the bank and TVEs

Timing: 2004 - 2005

Objectives: Assist TVEs in soliciting funds for their EE project

Activities:

(1) Facilitate the pilot to apply funds to the project (the Entrustment Loan Facility and the RCF) to assure a smooth implementation of the pilot project;

(2) Assist the pilot to straighten out its financial affairs make public of its financial performance and contact the leading group in change of security listing of Jiaxing municipal and Zhejiang provincial government respectively; help the pilot to get ready for its security increase by further ratifying its management system thereby making the appraisal to be passed smoothly;

(3) Comply with developing trends of security listing and financing, assist the pilot in coordinating with financial authorities to facilitate the pilot for security listing in a timely manner thereby making it possible in getting enough funds for its EE project;

(4) Take active measures to assist the pilot in access to the Guarantee Fund for SMEs. Through the PIC to facilitate Tongxiang Credit Guarantee Company to expand credit guarantee to the pilot.

4.3 Facilitate the pilot to get preferential treatment carried out

Timing: Dec. 2004 – Dec. 2006

Objectives: Assist the pilot in getting preferential treatment of the incentive policies carried out

Activities:

① To facilitate the carryout of incentive policies regarding that equipment used by the pilot that is in line with the Category of Equipment for Clean Production; allow the equipment to be accelerated depreciated by the pilot; energy audit and training expenses should be calculated into the business operation account.

② All expenses related to or for EE should calculated into business management account, and its proportion should be increased accordingly;

③ Carry out those not yet fulfilled preferential treatment of tax drawback under the incentive policy regarding comprehensively use of resources till the percentage of 35%.

④ Facilitate the pilot to get financial subsidy and interest deduction carried out;

⑤ Given the pioneer of the waste heat power generation technology applied onto a cement line in Zhejiang Province, there is lack of precedents in getting preferential treatment in this connection. The LPIC should coordinate with provincial authorities in charged to have the technology listed into the policy of comprehensive use of resources thereby make it enjoy the treatment.

4.4 Facilitate the pilot to minimize barriers to introduce qualified scientists and technicians, gain technical information and funds

Timing: Dec. 2005 – Dec. 2007

Objectives: Collaborate with Cement Association to assist the pilot in removing barriers to introduce qualified professionals and technicians, gain technical information and funds

Activities:

① Through Jiaxing Cement Association, facilitate access to limestone supply for the pilot;

② Integrated with the Association's normal business, establish an information network of cement market, equipment and qualified professionals and technicians for TVEs;

③ Create a mechanism of exchange of qualified professionals and technicians for cement sector in collaboration with the Association;

④ Coordinate with cement associations of Jiaxiang and Shanghai to cancel the licensing system for marketing cement into Shanghai market thereby creating a fine environment for cement marketing.

4.5 VA replication

Timing: 2007

Objectives: Replicate the VA mechanism

Activities:

① LPIC circulate a notice on the replication of the mechanism within cement sector in Tongxiang

② LPIC accept and hear TVEs' application on VA

③ LPIC recommend potential or candidate pilot TVEs to the project management office;

④ LPIC facilitate the signature of the VA between local governmental authorities and TVEs.

4.6 Facilitate to organize a workshop to disseminate the waste heat power generation technology

Timing: March 2005

Objectives: Publicize EE and GHG emissions reduction and disseminate the VA mechanism; disseminate the waste heat power generation technology in cement sector

Activities:

① Cast a video program namely "Technical renovation for EE at Shenhe Cement Co. Ltd." focusing on the application of VA, and play it at Tongxiang TV station;

② Assist the PMO in organizing an activity to disseminate the technology in cement sector;

③ Hold an on-site workshop to publicize the pilot in particular the application of VA;

④ Train TVEs, who is willing to sign VA with the local government, in April 2007; identify and recommend potential participants to the PMO.

Annex11.4.2.1:

Field Survey Report on Establishment of LPIC

In Tongxiang, Zhejiang Province

According to the UNDP/GEF project of "Energy Conservation & GHG Emission Reduction in Chinese TVEs" and in order to facilitate the cement sector in Tongxiang, Zhejiang Province, to remove barriers to policy enforcement, technology introduction, project funding and product marketing for energy efficiency, a team, led by Ms. Wang Guiling, Deputy Director of the PMO, and Ms. Wang Hui, the team leader of the contract, and consisted of experts and task members of the contractor, paid a 5-day field survey in Tongxiang, Zhejiang Province from September 6 to 10, 2004. The survey was conducted by means of meetings, questionnaire and on-site visit. The aim for the survey is to facilitate the establishment of Policy Implementation Committee of Shanxi Township and Village Coking Sector (hereafter the LPIC) and its capacity building, the local Policy Implementation Committee (hereafter LPIC) in Tongxiang.

Findings of the survey are as below:

1. The situation of the industry and cement sector in Tongxiang

Tongxiang city is located at the hinterland of the plain between Hangzhou Lake and Jiaxing Lake and the center of the golden triangle of Yangtze River between Shanghai, Hangzhou and Suzhou. It is close to the east suburb of Jiaxing city and Wujiang city on the north, near Haining city on the south, and with Deqing and Yuhang counties on the west, with Huzhou city on the northwest. It is 65 kms from Tongxiang to Hangzhou, 149 kms to Shanghai, 60 kms to Xiaoshan international airport of Hangzhou and 115 kms to Hongqiao international airport and 130 kms to Pudong international airport of Shanghai.

Since the implementation of 9th Five-year National Plan, All industrial enterprises in Tongxiang have conformed actively with the development of market-oriented economy by developing a new and high technical industry with a strategies of creating famous brands and enforcing technical renovations. As a result, a considerable number of the enterprises' has improved significantly thus providing a sound foundation for the industrial and economical development. By 2003, the number of industrial enterprises reached 28,300 including 10 large-sized ones and 32 medium-sized ones. The total assets of the medium-sized industrial enterprises has reached over ￥19 billion RMB, and their annual turnover registered over ￥19 billion RMB. Since then, a considerable number of the enterprises has improved their equipment to a higher level thereby raised the competition of their products. There emerged a batch of large and medium sized enterprises. With famous product brands, some group companies and large-sized enterprises are established. By the end of 2003, a total of 66 enterprises has got their annual turnover over ￥50 million RMB

including 29 enterprises has got the figure over ￥100 million RMB.

Tongxiang is an import base for cement and brick production in Yangtze River Delta. Cement and brick making, together with other building material sectors, play a significant role in Tongxiang's industry. It characterized by large in total enterprise number and small in output per enterprise. Detail information of the enterprises sees Table 1 below.

Table 1. Number and production value of enterprises engaged in cement and other building material sector in Tongxiang

	Measurement	Cement Sector		Building material industry		TVEs	
		2002	2003	2002	2003	2002	2003
Enterprise	number	17	18	189	183	376	364
Total output value	100 million RMB	8.6	11.4	18	27.4	24.8	38.8

The table shows that the total output value of all TVEs in Tongxiang was ￥3.88 billion RMB. Of which, contribution from cement sector was ￥1.44 billion RMB accounting for 29.4% of the total of all TVEs. Cement is the backbone sector that engaged by TVEs in Tongxiang.

In the meantime, as the backbone sector in Tongxiang, the output of cement sector accounts for 41.6% of the total of building material industry. Up to now, there are a total of 18 cement enterprises with annual capacity of 5.1515 million tons of cement valuing ￥1.14 billion RMB. 3 cement producers are ranked in the10 top enterprises for their output value and taxation. Of which, Shenhe Cement Co. Ltd., one of the pilot TVEs of the project, are included.

The cement sector in Tongxiang is not well structured though it plays a key role in the while industry. Most of the kilns applied are of shaft type characterized by small size and low capacity. Within the 18 cement enterprises, only two have introduced new dry cement process lines, which are of the advanced production technology. This means that most of the kilns need to be renovated or eliminated in accordance with the industrial policy. Detail information of the kilns sees Table 2.

Table 2. Production equipment and capacity of cement sector in Tongxiang

Equipment	Quantity	Capacity (t/y)	Date of starting
2500t/d line	1	1 million	2004
1000t/d line	2	0.6 million ×2	2001

Hollow dry process rotary kiln	2	0.20 million ×2	1991
Shaft kiln	26	0.11million×26	1990-1997
Milling station	3	0.50 million×2	2003

The general situation of cement sector in Tongxiang is roughly the same as that in regions enclosing Jiaxing city including Jiashan, Pinghu, Haining and the suburb of Jiaxing characterized by with vast market potential, long cement production history, outdated production technology, small production scale per each enterprise and plying a important role in the local industry.

2. Energy consumption of the cement sector and Tongxiang

In terms of administration, Tongxiang is under the Jiaxing Municipal. The Jiaxing municipal governs two districts, namely Xiucheng district and Xiuzhou District, three cities, namely Tongxiang city, Haining city and Pinghu city, and two counties, namely Haiyan County and Jiashan County. The characteristics of overall industry of Tongxoang are roughly the same as other regions governed by Jiaxing municipal. The energy consumption in Tongxiang ranks at the middle or higher level in Jiaxing, and its energy efficiency is at the top level. Detail information of energy consumption in Jiaxing sees Table 3.

Table 3 Energy consumption per ￥10,000 RMB industrial output in Jiaxing

No.	City/County	July 2004	The corresponding period of last year	Increase (± %)
1	Jiaxing	11.68	9.62	2.1
2	Urban district, Jiaxing	11.61	2.97	8.6
	Xiucheng District	13.85	0.26	13.6
	Xiuzhou District	4.61	7.27	--2.7
3	Jiashan	17.22	--18.32	35.5
4	Pinghu	15.57	6.02	9.6
5	Haining	13.17	13.19	0.0
6	Haiyan	1.69	19.38	--17.7
7	Tongxiang	15.98	11.95	4.0

As the same as that in other regions, cement sector is a big energy consumer. Table 4 below shows that, as a big energy consumer, Tongxiang's cement sector consumed a total of 635,700 tons of coal in 2003. Therefore, to conduct technical renovation for energy efficiency in the sector will not only benefit the region's environmental protection, but also benefit the sustainable development of the sector.

Table 4 *Energy consumption in Tongxiang's cement sector*

	Unit \ Year	2002	2003
Output	100,000 tons	343.15	515.15
Energy consumption per unit	1 Kg coal /ton cement	0.1315	0.1234
Total energy consumption	10,000 tec	45.12	63.57

Located on Hangzhou-Jiaxing Plain, Tongxiang is charactered by almost without any raw industrial resources as most regions in Zhejiang Province. There are no any resources for cement production in Tongxiang. Limestone, shale and copper slag nor coal should be purchased from outside of Tongxiang. In addition, the increasingly short of energy and raw materials supply have huddled the development of the local cement industry. Even more, the short of power supply and the soaring price of coal have imperiled the existence of the industry. See Table 5 for detail.

As the main fuel for cement production, its cost affects greatly the production of

cement clinker, ranking number 1 in the total cost of cement production. Details see Table 5-1。

Table 5－1 Impact of coal cost to cement production (Measurement: RMB￥)

Time	Coal cost	Clinker cost	Coal cost per ton of clinker	Proportion of coal cost per ton of clinker
2003.12	300	150	45	30 %
2004.7	600	185	98	52 %

5-2 Impact of power cost to cement production (Measurement: RMB￥)

Time	Power Price	Clinker cost	Power cost per ton of clinker	Proportion of power cost per ton of clinker
2003.12	0.51	150	35.7	23.8 %
2004.7	0.59	185	40.3	22 %

The impact of power to cement production is two fold. One is that the increase power price can cause rise in clinker cost, the price has increased from ￥35.7 RMB in 2003 to ￥41.3 RMB in this year. See Table 5-2 for detail. While the second is that the short supply of power severely huddles the normal production. During the peak period of power consumption this year, the power supply can meet only 10% of the total demand, i.e. the normal power demand is 28000 kW and the exact supply is only 3,000 kW.

Limestone is one of the main raw materials for cement production. Its soaring price, which is due to cost increase and short supply that may caused by tight control (monopolization) of the local government of place of origin, directly impacts the production cost. See Table 5-3 for detail..

Table 5-3 Impacts of limestone cost to the production (Measurement: RMB￥)

Time	Limestone price	Clinker cost	Limestone cost per ton of clinker	Proportion of limestone cost per ton of clinker
2002.12	23	150	27	23.8 %
2004.7	39	185	43	23.3 %

3.General situation of the pilot TVE

The Shenhe Cement Co. Ltd., one of the project's pilot TVEs, is located in Tongxiang City and was established in October 1975 with registered assets of RMB ￥45.89 million. The company has a total of 852employees, one Φ3×11Mmechanical shaft kiln, one new dry process rotary kiln with a capacity of 1000 tons of cement per day and another new dry process rotary kiln with a daily capacity of 2500 tons of cement clinker. The total cement output include 1.1 million tons of cement with a

category of P.O32.5， P.O 42.5, P.S 32.5 and P.S 42.5, and 0.80 million tons of cement clinker.

By the end of 2003, the company has fixed assets of RMB ¥ 270.29 million, and is with liabilities of RMB ¥ 93.05million accounting for a deficit rate of 35%.It registers an annual output of 0.9165million tons of cement, turnover of RMB ¥ 213,220 with net profits of RMB ¥ 62.68 million.

The company has a self-contained management system that has passed ISO9001-2000certification. It is rated as AAA for its credit by the bank. Its product under the brand of "Suihe" has been certified as "National Exemption from Inspection Product" and "the Highly Recommended Product" by Zhejiang consumer's Association.

The statistics of 2003 shows that the company is one of the largest cement producers in Zhejiang Province. Its cement product accounts for 18% and clinker for 100% of the total in Tongxiang.

Along with the putting into production of its technical renovation projects, the proportion of output value of the company will see a further increase to that of Tongxiang in 2004.

Table 6 Production of Shenhe Cement Co. Ltd. in 2003

		The whole cement sector	The company	Proportion of the company to Tongxiang
Total output value	Million RMB	11400	225.38	19.8
Total output	Million tons	5.1515	0.9138	17.7
Employee	人	4600	652	14.2

The total investment made by the company on technical renovation and environmental protection have reached RMB ¥ 237.93 million since 2001, with an average annual investment of RMB ¥ 79.31 including RMB ¥ 16.5468 for environmental protection， accounting for 7% of the total.

4. The administration of cement sector and possibility to establish LPIC in Tongxiang

Along with the deepening institutional reform in China, the TVE Bureau, SME Bureau, Economic and Trade Bureau and Building Bureau have been consolidated as Tongxiang Economic and Trade Bureau under the municipal. All maters regarding cement sector and its technical renovation shall be under the administration of the bureau.

The Tongxiang municipal attaches great importance to the development of cement sector. In 2001, it was specified in Tongxiang's 10^{th} 5-year plan that it will pay great attention to energy efficiency and environmental protection in cement sector by means of technical renovation. Along with the program of the provincial government to build Zhejiang as an ecotypic province, the Tongxiang municipal developed a program namely " Program to build Tongxiang as an Ecotypic Demonstration Region". According to the program, all sectors, including agriculture, industry, urban construction, tourism and culture, should be developed in an ecotypic way. Seven engineering related to land and atmosphere cleaning, gardening, noise declining, environment cleaning, as well as local feature distinguishing and pilot demonstrating were established accordingly. By the end of 2002, implemented key projects under the program reached 115 accounting for 94.3% of the projected total. The total investment reached RMB ¥3.4 billion accounting for 113% of the project total.

Of the seven engineering, the atmosphere cleaning is directly related with cement sector. To implement the program, the municipal takes establishing regions of emission control as the cut-in point and focuses on the control of fly ash and emissions. Reform in brick and tile sector has been completed. The production capacity has been reduced by 57.01% by eliminating 70 kilns. As a result, emissions of SO_2 have been reduced by 3,027 tons, fluoride by 703 tons and earth consumption by 3 million m^3 annually thereby not only reduced pollutant emissions but also protected land and clay resources. The municipal launches a plan to reform cement industry. Three production lines with Φ2.2 m shaft kilns have been closed down and

emission levels of 17 enterprises in the sector have reached the environmental control standards. Emissions of fly ashes have been reduced by 143,100 tons.

The establishment of LPIC and its capacity building projected by the UNDP/GEF project are in accordance with the municipal's program to develop cement industry and build ecotypic regions. The implementation of the project will facilitate to set up detailed targets, schedule and road map in the sector for energy efficiency.

The municipal attaches great importance to the project. It is proposed to establish LPIC consisting of the Municipal Office, Development Bureau, Economic and Trade Bureau, Science and Tech Bureau, EPA, Finance and Taxation Bureau and Tongxiang branch of ABC. The LPIC will be headed by a vice mayor in charging of industrial administration. The aim of the LPIC is to facilitate enterprises to remove barriers to product marketing, project financing, policy enforcing and technology disseminating in cement sector for EE.

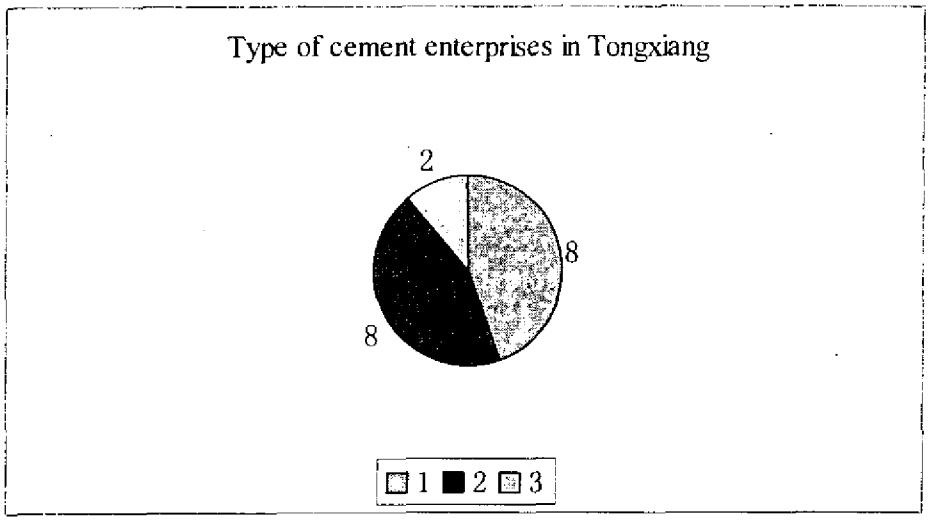
5. TVE's ownership in cement sector

Along with the deepening of industrial reform, the form of economical increase has changed from an extensive type to an intensive form. To be in line of the principle of "Cleared ownership, specified rights and responsibilities, divided governmental administration from business operation and scientific management", ownership of enterprises have been standardized with modern company system. SOEs had been reduced from 48 in 1995 to 17 by the end of 2003. None- state-ownership of enterprises has been developed rapidly since the 9th 5-year plan. In 2003, the total industrial output value accounted for 63.5% of the total, increased by 35.8% than that of 1995. Its total industrial scale has gone beyond the SOEs.

Among the existing 18 cement producers in Tongxiang, 8 are of collective owned enterprises, another 8 are company limited, 2 are share holding companies. The pilot TVE is a standardized company limited.

In the Table 7 below, type 1 stands for company limited, type 2 for share holding companies and type 3 for TVEs owned collectively.

Table 7 Ownership of cement enterprises in Tongxiang



6. Ownership reform and technical renovation for EE of the pilot

The pilot is a typical Chinese TVE. It grows up along with the development of China's economy, its ownership reform and its technical upgrade for EE. It is an epitome of Chinese TVEs' development.

An illustration of the pilot's development regarding ownership reform and technical upgrade is shown in Table 8.

Table 8 **Ownership reform and technical renovation for EE of the pilot**

Year	Enterprise	Ownership	Investor (owner)	Kiln type	Capacity (10,000 tons)
1975	Heshan Cement Plant	TVE	Tongxiang Heshan Township Authority	Indigenous	2.5
1991	Jiaxing Shenhe Cement JV	Joint venture	Heshan Township Authority and Shanghai Wusong Cement Plant	3*11 Mechanical shaft	15
1995	Jiaxing Shenhe Building Materials Group Co.	Co. Ltd.	Heshan Township Authority and shareholders	3*11 Mechanical shaft	15+16
1999	Tongxiang	Co. Ltd.	Private		15 + 16

	Shenhe Cement Co. Ltd.				
2000	Zhejiang Shenhe Cement Co. Ltd.	Co. Ltd.		1000 t/d NDP rotary kiln	15+16+60
2002	Zhejiang Shenhe Cement Co. Ltd.	Co. Ltd.			15+16+60
2003	Zhejiang Shenhe Cement Co. Ltd.			2,500 t/d NDP rotary kiln	15+16+60 +80 clinker

The table shows a road map of the ownership development of the pilot from a collective business – primary company limited – standard company limited – share holding company. Upon each step of the ownership reform, the technology upgraded and investment increased, and the production capacity increased and product also upgraded. The process of the pilot developed from the original indigenous kiln – mechanical shaft kiln – rotary kilns. Therefore, the ownership reform is the prerequisite and the foundation of technical renovation.

The pilot follows a principle of combine technical renovation with the overall energy efficiency during its technical upgrading. What the overall energy efficiency means covers elements of concepts, management, regulation, equipment, information and weather. This means that the EE should be conducted by everyone of the pilot and in all the time. All production procedures are under strictly control including raw materials purchase, transport, storage, treatment and distribution, etc. In addition, the pilot adopts a development strategy of combining long-term development and its short term profits. Without gaining the short term profits, an enterprise can not be able to either implement its project for EE or exist, and no matter to further itself eventually. The pilot takes environment protection and enforcement of policies and regulations concerned as its development momentum, and believes this will definitely bring it with long term benefits both economically and socially.

7. Policy enforcement in cement sector

7.1 Policy regarding value added tax drawback

Ii is stipulated, in a decree of "Notice on a Policy regarding Comprehensive Use of Resources and Value Added Tax" (Caishui No. 〔2001〕198) enacted by MOF and State Taxation Administration on December 1, 2001, that value added tax for cement

produced with no less than 30% additives of gangue, fly ashes, coal slag (except furnace slag) or other industrial wastes shall be drawn back while it is levied.

It is also prescribed, in the provision of "Notions on the Certification of Comprehension Use of Resources for Cement Production" (Zhe ETR No.[2003] 39), which was enacted by Zhejiang Economic and Trade Committee, that 1) Principally, projects/enterprises engaged in comprehensively use of resources should not be certificated in one of the following cases starting from March 1, 2003. They are (1) cement production with mechanical kilns of annual capacity less than 150,000 tons per annual; (2) enterprises with shaft kilns of diameter of less than 2.6 meters; (3) shaft kilns that to be replaced with NDP rotary ones or clinker milling stations (effecting from the operation of the new lines/stations); (4) cement production lines that are prohibited by explicit order of the government at national, provincial or county levels; (5) enterprises that have been punished for environmental hazards, severe accidents or product quality defects occurred in their production should not be certified principally. 2) To support and encourage the development of bulk cement production. In principle, only such enterprises/projects can be certified for comprehensive use of resources that their cement production is with rotary kilns and over 50% of the output is in bulk. And the rate of bulk cement should be reached to over 70% two years later. For other shaft kilns, except those prohibited ones as described in above-mentioned clauses (1), (2), (3) and (4), their rate of bulk cement produced shall be 40% or over.

Although the pilot has passed the certification, but due to lacking of tax sources, the incentive policy was made real partially in 2003.

7.2 Elimination of small-sized shaft kilns

In accordance with the national decrees of "Notice on the elimination of small-sized glass factories and cement plants" (Guobanfa No. 4 9 〔 1 9 9 9 〕) enacted by the state council and "Category of eliminated outdated production processes and products (1st batch)" (NETC No. 6 〔 1 9 9 9 〕), all medium and small-sized cement plants with shaft kilns shall be phased out by 2006. By now, most

shaft kilns have been eliminated in Tongxiang.

7. 3 Market protection

It is ruled in a decree of "Notice on strengthening the control of cement used in engineering constructions" (Zhe JMJYM No.1273 [2002]) jointly enacted by Zhejiang ETC, Construction Bureau, Communication Bureau and Water Conservancy Bureau that 1) Cement used for all types of engineering constructions must come up to the national standard. Key constructions, urban tall housing buildings, commercial concrete stations, all types of large and medium sized dams, bridges, tunnels, culverts, water gates, high quality concrete road, foundations and structures of all types of large and medium sized constructions (including bearing lift-slabs/structures must use cement produced with rotary kilns; 2) Any builder/contractor shall not ask, for any reason, the design institute or building section to use prohibited types of cement; 3) the design institute shall follow the abovementioned regulations in selecting cement types but shall not dedicate a certain brand of cement products. If they do not follow the regulation, the design shall not be approved; 4) The builder shall examine strictly the quality of cement used/purchased and use it according to the design; 5) The construction supervisor shall review the test sheet of cement brought on the site, and find out and take measures to correct mistakes if any in a timely manner. The supervisor shall review cement trade documents/contracts before his signing a material application sheet; 6) Authorities in charge of quality control shall strengthen the examination of on-site used cement, take every measure to prevent the use of non-qualified cement products.

7.4 The sector reform

The cement sector reform has been implemented by following out the state council's decree of "Notice on Preventing of Unreasoning Investment and Speeding Up The Reform In Cement Sector" (Guobanfa No. 103 [2003]), the provincial governmental decree of "Notions on preventing unreasoning investment in production of iron and steel, electrolytic aluminum and cement" (Zhe ZBF No. 10 [2004]) and

" Notions on furthering and speeding up cement sector reform" enacted by provincial ETC. It is stipulated that 1) to prevent overheat of investment in cement sector by strictly following out national policies, each of the local governmental authorities shall, based on their practical situations, plan for or modify its own development strategy and take every means to prevent investment overheat. Under the severe situation of power shortage, all new cement kilns with a capacity of 4000 t/d shall be developed based on pre-conditions of industrial policy, location, land resources, environmental protection, limestone and power supply, etc. In principle, new process lines with rotary with a capacity of less than 4000 t/d shall be prohibited. As for clinker milling stations, the diameter of the milling machine shall be over 3 meters. New projects shall be controlled under the principle of " with controlled total production capacity, reasonable location, available raw resources, in line with regulations for environmental protection and local government's development plan". To support the application of waste heat power generation onto cement lines with a capacity of 2000 t/d to save energy and settle power shortage; 2) Take effective measures to speed up the elimination of outdated production technology, develop targets for phasing out outdated shaft kilns and other old technologies. In principle, all shaft kilns shall be phased out by 2007; 3) strictly control the certification of projects or enterprises for comprehensive use of resources in accordance with the national and local decrees concerned. Cancel those certification such as kilns with an annual capacity less than 150,000 tons, shaft kilns with its diameter of less than 2.6 meters or enterprises that have not make real to phase out prohibited types of kilns what they promised when applying the certification; 4) Strictly control power supply to mechanical shaft kilns; 5) Strictly control the use of cement made with shaft kilns; 6) Strengthen the control of limestone mining. All limestone mining shall be conducted strictly in accordance with regulations and laws related to environmental protection and technical standards and make the business developed in a sustainable way.

7.5 Environmental protection policy

Under China's legislation system, there are bout 8 codes and regulations involved in environmental protection including "Appraisal System of Environmental

Impacts of Construction Projects", "Charging system of pollutant discharge", "Rational assessment system of urban environmental control", "Targeted responsibility system of environmental protection", and "Register system and license system of pollutant discharge", etc. Among them, the most closed ones to local enterprises are "Appraisal System of Environmental Impacts of Construction Projects", "Charging system of pollutant discharge" and "Register system and license system of pollutant discharge", etc.

In accordance with the above mentioned national decrees, Tongxiang municipal has called off all the operation of mechanical shaft cement kilns, and strictly follow out the "Emission standards of atmospheric pollutants" (GB4915—1996) . Any production shall be renovated within a definite time or call off or eliminated if it can not come up to the standards.

There many projects to newly erect, renovate or enlargement cement production in Tongxiang. All these shall be implemented strictly follow out policies related to environmental control. There is no any punishment measure applied legally regarding the violation of "Assessment system of environmental impacts", eventually, there is no censor system among China's legislations. In this connection, to set up a workable mechanism to effectively coordinate between governmental authorities that are in charge of planning, economic development, project administration, and project agencies and implementing parties and environmental protection agencies, etc. thereby making them work according to the line of duties. This can be realized by a LPIC.

8. Product marketing related to the TVE

8.1 A steady market

Cement output registered a great increase in Zhejiang province in 2003, at 71.40 million tons reached a record-breaking high, 23.97% than that of the last year.

The increase of cement output in Jiaxing and Tongxiang is higher than the average level of the whole province. In Zhejiang province, the overall turnover of cement products registered 19.97 billion RMB, 41.51% higher than the last period with an output-sales rate of 100.3% reaching a record-breaking high. Based on a

statistics, China's total cement output reached 725 million tons in 2002, 847 million tons in 2003 ranking the first all over the world. And the demand for cement is about 700 – 800 million tons. The demands and output are generally in balance. As the output is increasing and market demands is slowing down in 2004, the overall market is quite steady.

8.2 Factors affecting the market

Though the marked demand looks good, but given types of cement kilns are mainly of shaft ones in Tongxiang, while in its bordering regions there will be six 5000 t/d lines and five 2500 t/d lines erected in succession. This brings a heavy competition to Tongxiang's cement industry, and forces Tongxiang's cement sector to renovate its production processes.

9. Financial situation of the pilot

As the largest cement producer in Tongxiang, the total output of the pilot accounts for 18% of the total. Since 2001, the pilot has invested 237.92 million RMB into technical renovation. Of which, 108.92 million RMB was funded by the pilot itself and 90 million RMB was funded by the bank. As for the 17.7 million RMB invested in the waste heat power generation plant on the 2500t/d cement line, it was all funded by the pilot.

Along with the reform of the banking system in China, state owned banks have been transformed into commercial banks. And loans placed by the banks must be pledged with land, plant buildings or equipments. As the same as other enterprises, the pilot is at the same awkward situation as it can not find qualified guarantees for its loans. On the other hand, the stiffen regulations applied by the banks on making loans also constrained banking officers.

10. Technical situation of the pilot

Cement enterprises in Tongxiang is suffering from in short of technical information. Only a few entrepreneurs of the18 cement enterprises have participated in a study tour abroad though most of them have been in the business for some long times. And the chief engineers of the enterprises lack of basic theoretical acknowledges. In addition,

only 1% of the total employees are with a senior professional title. It is an urgent need for them to get technical support form both local and abroad. Detail information sees Table 9.

Table 9 Staffing structure of cement enterprises in Tongxiang

	Total employees	Employees with a senior title	Employees with a intermediate title	Employees with a primary title	Junior and senior high school graduates
Total	4600	79	166	317	4038
% of the total	100	1.72	3.61	6.89	87.78

Similarly, the pilot is also facing problems of lack of qualified professionals and advanced technologies. To solve the problems, they have to recruit engineers from far outside, i.e. Hubei, Jilin, Xuzhou or Hangzhou.

11、The pilot project

Due to constrain of cindering technology and poor energy efficiency, a considerable lots of medium and low temperature heat generated during the production are not used thus causing significant energy waste. Waste heat lower than 420℃, exhausted from the cooling system of the kiln head and from the pre-heater at the kiln end, accounts for over 40% of the total heat consumed in the cindering system. This also costs a lot of power, i.e. to produce one ton of clinker consumes 100 ~ 120kWh power. To recover the wasted heat and improve the energy efficiency, the pilot.company decided to build a power generation plant onto the 2500 t/d line. The total capacity of the plant is 3 MW. Its technical performance include: installed capacity – 3MW; power generation - 2094×10^4kWh/y; power supply to the cement plant - 1834×10^4kWh. It equals a power saving of 2094×10^4kWh per annual, or saves 14488 tons of coal equivalent, or reduces 20000 tons of CO_2 emissions. Within the whole life cycle of the power plant, CO_2 emissions reduction can reach to 450,000 tons.

The power generation technology is in line with technologies supported by national authorities and stipulated in several of national decrees, i.e. "Notions on furthering the development of comprehensive use of resources" (Guofa No. 36[1996])

by the state council in 1996 and "Notice on certification of power plant to comprehensively use resources" (NETC Ziyuan No. 660 [2000]), etc.

The technology is also listed in a decree of "Category of guiding technology for clean production in national key sectors (2nd batch)" (No 21[2003]) jointly by NETC and SEPA. In the decree, it clearly stipulated that the waste heat power generation technology is of the key promoted technologies.

12 Barriers faced

12.1 Lack of resources

The cement production is a highly resources-relied sector, but the site, where the pilot is located, is in short of resources including limestone which needs to be purchased from Changxing county of Zhejiang and Guangde county of Anhui province where 150 km far away are. This brings shortcomings due to long distance transport which can severely affect the normal production. Furthermore, coal used in cement production should be imported from Shandong and Shanxi provinces, its soaring price, long transport period and uncertain quality also brings bad impacts to the production.

Shortage of power supply. At the peak of power consumption, only 3000 kW of power was available for the pilot while its total demand is 28,000 kW.

These three defects, shortage of power, limestone and coal supply, have become the bottle neck of the pilot.

12.2 Technical barriers

Though the cement sector is labor intensive, but, along with the technical improvement and fierce market competition, the pilot is facing a shortage of professional employees, either on the 1000 t/d line or the 2,500 t/d line. They have to introduce engineers from Jilin and Hubei provinces. Similarly, an expert has to be recruited for the waste heat power generation project. Even though, the pilot is still facing a shortage of qualified professionals. On the other hand, the pilot needs timely technical information and trainings.

12.3 Financial barriers

During the technical renovations, lack of funding is a severe problem faced by the pilot, which is mainly due to there is lack of available means for TVEs/SMEs to get funding under the current financial system.

Analyses

a. Due to small in scale, without professionals and not familiar with stock exchange, it is not possible for TVEs/SMEs to get funding from the stack market, by means of neither selling nor issuing stocks on the market.

b. Since it is not allowed for a TVE/SME to get fund through a non-governmental channel, there has been no any available means for them to get funds out of the governmental financing channel, though there are some potentials in this regard.

c. The only way for them to get funds is to apply loans from the bank, but the complex documentations and formulations as well as those inflexible procedures and preconditions hurdle them and affect the implementation of the pilot project.

12.4 Policy barriers

a. According to the decrees related to the comprehensive use of resources, the pilot can enjoy preferential treatment of drawing back –while-levying of value added tax. Practically, due to in short of taxation sources, the pilot only enjoys about 35% of the total due.

b. Constrained by local protectionism, the pilot can not assess to a fair channel or market to gain resources for its production. For example, the pilot tried to purchase limestone from Changxing, Anji and Guangde, but are all failed. Eventually, some local governments enacted regulations to prohibit local miners from selling raw materials out of the county. In the meantime, the governments also raise the prices by monopolizing the resources. This is the same like selling cement into Shanghai. Cement produced in Tongxiang shall apply for a permit.

c. Policies are not properly matched with each other. Due to tying on individual interest of each governmental authority, TVEs/SMEs feel difficult to deal with them,

no matter to deal with environmental protection agencies for paying environmental protection charges, or deal with technical supervisors or other authorities in charge of labor affairs, sanitation, communication, or traffic cops.

13. Conclusions and suggestions

13.1 Expedite the waste heat power generation plant onto the 2000 t/d new dry process line of the pilot. It is also proposed to build another power generation plant onto its 1000 t/d rotary kiln subsequently thereby improving energy efficiency at the pilot and better the environmental protection.

13.2 Apply issuance of corporate bonds

Funding is a key barrier to the development of cement sector in Tongxiang, and it is better to have the barrier removed through the cooperation of the project, the local government and local enterprises to facilitate funding for their technical renovation and upgrade. Conditions for the pilot to place funding on stock market is not ready, and funding through nongovernmental means meets barriers from aspects of legislation. Therefore, it is suggested getting funds/loans through a guarantee institute. In addition, it is also suggested that the pilot apply the issuance of corporate bonds on the stock market through the coordination of the project and local governmental authorities concerned for its lone term funding.

13.3 Expedite the operation of Entrustment Loan Facility

As an advanced and practical technology, the waste heat power generation (without adding fuel) technology processes a great prospect in China. The pilot project is under construction at the Shenhe Cement Co. Ltd. Due to some unforeseen reasons, cost of the project has been overspent, over than the budget of RMB ¥ 10 million. To ensure a smooth implementation of the pilot project, it is suggested that the Hongyuan Company should endorse an entrustment loan to the pilot TVE together with the commercial loan from ABC as soon as possible.

13.4 Facilitate the pilot with technical experts and information

As one of the project pilots, Shenhe needs assistance from the project regarding introduction of professional experts and technical information.

Agenda of the survey

2004

Date	Meeting	Topics	Venue	Participants
Sep. 6	Working conference	Finalize a schedule for the survey	Hotel	PMO, S.C., CTA, local policy expert and cement expert
Sep. 7	Cement TVEs' workshop	1. TVE's ownership reform and operation 2. Situation, willingness and barriers to adoption of EE tech; 3.Enforcement of and barriers to policies regarding EE and environmental protection; 4. Anticipation and suggestions from TVEs	Hotel	PMO, S.C., CTA, local policy expert, cement expert and cement TVEs' entrepreneurs
Sep. 8	LPIC meeting	1. LPIC statute 2.enforcement of national and local policies 3. Measures and programs regulations of the local industry and cement sector for EE 4. Willingness to participate and potential support to the project from parties concerned	Hotel	PMO, PIC, CTA, S.C., LPIC and local policy expert
Sep. 9 a.m.	Discussion on VA	1. Visit the pilot 2. Finalize the EE framework 3. VA	The Pilot	PMO, PIC, CTA, S.C., LPIC and local policy expert
Sep. 9 p.m.		Discussion (VA)	Hotel	
Sep. 10	Visit EPA, Science & Tech Bureau and local branch of ABC	Continuing the survey and collecting local policies and regulations concerned	EPA, Science & Tech Bureau and local branch of ABC	PMO, S.C. and local policy expert

Annex11.4.3:

Energy Efficiency Voluntary Agreement

BETWEEN

Government of Tongxiang City, Zhejiang Province
(Hereinafter referred to the Government)

AND

Shenhe Cement Co. Ltd. in Tongxiang City, Zhejiang Province
(Hereinafter referred to the Demonstration Enterprise)

1. Background

1.1 Energy Efficiency Voluntary Agreement is an agreement that is entered voluntarily by and between a trade organization or individual enterprise and the government in order to improve energy efficiency and reduce greenhouse gas emissions. Industry organizations or enterprises commit to meet the target of energy efficiency or GHG emission reduction, and the government provides preferential policies and/or other incentives to the industry organizations and the enterprises.

1.2 The Project of "Energy Conservation and Greenhouse Gas (GHG) Emissions Reduction in Chinese Township and Village Enterprises ("TVEs") – Phase II, sponsored by the GEF, was implemented by the United Nations Development Program (UNDP), and executed by the Untied Nations Industrial Development Organization (UNIDO) and Ministry of Agriculture (MOA) of the People's Republic of China. The purpose of the Project is to help Chinese township enterprises to adopt efficient energy conservation technologies and reduce the greenhouse gas emission from brick industry, cement industry, casting industry, and coke industry in China.

1.3 In order to formulate and implement action plans to promote regulatory reforms and commercialization of energy efficiency technologies and projects among TVEs, the Energy Conservation Voluntary Agreement is formulated so as to improve energy efficiency, reduce greenhouse gas emissions and carry out the national "medium-and-long-term special energy efficiency layout" in respect of generalization of the spirit of Energy Conservation Voluntary Agreement.

2. Targets of Energy Conservation

2.1 Through the Voluntary Agreement implement, the Government shall fulfill the transformation of governmental function and explore a new mechanism aimed to achieve the same energy conservation goal but without compulsory commands. Furthermore, the Demonstration Enterprise shall reduce production cost, improve product quality, protect environment, and thus, establish a better public image for the enterprise.

2.2 The Demonstration Enterprise establishes voluntarily the following direct Energy Efficiency targets: based on 2003 (reference year), by 31st December 2005, the Demonstration Enterprise shall complete the Energy Conservation Project and achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 10%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 15%.

Indirect Energy conservation: through improving product quality, saving raw material, reducing the proportion of cement in concrete, prolonging product life, energy can be indirectly conserved.

2.3 Because the government adopts stricter environmental standard and more energy is consumed, the targets shall be adjusted if the conditions occur.

3. Measures for Energy Conservation

3.1 In order to fulfill the target of Energy Conservation on time, the Demonstration Enterprise shall establish a concrete Energy Conservation Plan, which shall be reviewed and approved by the Government, and implement the plan carefully.

3.2 The Demonstration Enterprise shall enhance the energy management, establish energy management system and energy efficiency standards, improve the internal regulations, assign full-time energy manager to be responsible for the energy management, improve employee's consciousness of energy conservation.

4. Preferential Policies

4.1. The Government shall take the Demonstration Enterprise as a key supporting enterprise. The support includes imbursement on scientific research, technological innovation, and environmental protection, and implementation of the national policy on tax reduction or exemption related to utilization of wastes such as waste residue and other national or local encouragement policies and measures for energy conservation and environmental protection. Depreciation acceleration can be applied to the equipment in the Clean Production List. Energy audit and training expense for the Energy Conservation Project can be included in the management cost. The proportional limit of cost of R&D on energy conservation can be increased and included in the management cost.

4.2. The Government committed to assist the Demonstration Enterprise in solving financing problems such as financing difficulties through the governmental credit system for medium- and small-scale enterprises and to recommend the Demonstration Enterprise to apply for recycling fund loan and other commercial loans, which will be used in the energy conservation project.

4.3. After the Demonstration Enterprise signs the Voluntary Agreement, the Government shall promise to recommend for the pilot program as well as award the honorable title to the Demonstration while introducing and extending the experience of the Demonstration Enterprise in the pilot on media.

5. Monitoring and Assessment

5.1 The Government shall submit an Annual Report on implementation of the Voluntary Agreement to the PIC in the first quarter of the year and receive the instruction from the PIC.

5.2 The Demonstration Enterprise agrees to receive assessment of the effect of the Voluntary Agreement implementation by a Technical Team established by an independent third party.

5.3 In the valid period of the agreement, the Demonstration Enterprise shall submit an annual Supervision Report to the Government and the Technical Team in written form in the first quarter every year, and submit the final report in the first quarter in the next year after the Agreement ends. The report shall include: production statistics, energy consumption data, status of implementation of Energy Conservation Plan and Energy Conservation Project, effect of energy conservation, problems and barriers, plan for the next year, measure adjustment, experiences and lessons, and suggestion for perfecting the Voluntary Agreement.

5.4 The Technical Team is responsible for evaluation in the implementation of the agreement, including the evaluation of the Energy Conservation Plan, Annual Monitoring Reports, the Interim Report, and the Final Report submitted by the Demonstration Enterprise. The Technical Team shall inform the assessment result in writing to the Government and the Demonstration Enterprise. The assessment report shall cover evaluated comments on the authenticity of data, the Energy Conservation Plan and projects of the Demonstration Enterprise, the status to meet the targets, and the suggestion on Agreement modification.

5.5 If the Evaluation Report indicates that the Demonstration Enterprise failed to meet the requirement that the Agreement defines, the Demonstration Enterprise shall adopt measures including identifying problems, seeking new energy conservation measures, improving the energy conservation efforts in the next year, modifying energy conservation plan, based on the advice from the Technical Team.

6. Modifications and Termination

The agreement shall be modified or terminated if the following conditions occur:

- ✧ The Laws, Regulations, or policies related to energy or environmental protection have big changes compared with the year when the agreement is signed.
- ✧ Implementation of the Agreement has negative impact to the development or normal operation of the Demonstration.

The agreement shall come into force from the date it is signed and be invalid on 31st Dec, 2008. Any pending matters in the agreement shall be discussed jointly between parties and an additional agreement shall be entered and being equally valid.

Government of Tongxiang City, Zhejiang Province (seal)	Shenhe Cement Co. Ltd. in Tongxiang City, Zhejiang Province (seal)
Authorized representative	Authorized representative
Date:	Date:

Appendix:

Shenhe Cement Co. Ltd.

Energy Conservation Plan

1 Brief Introduction of the Enterprise

Located in Tongxiang City, Zhejiang Province, the Company has two vertical shaft kilns and two dry-process cement and clinker production lines with a capacity of 1,000t/d and 2,500t/d, respectively. The Company registers an annual production of 2 million tons of P.O42.5 and P.O32.5 Portland cement.

2 Energy Consumption of the Enterprises

Energy Consumption in 2003

Type of Energy	Consumption Quantity	Coefficient	In tce	CO_2 Emission (t-CO_2)
Raw Coal	100,212(t)	0.7143	72,295	180,231
Electricity	64,530,000 (kWh)	0.383×10^{-3}	24,717	61,619
Total			97,012	241,850
Cement production (t)			913,800	
Cement Energy Consumption per unit product (tce/t)			0.106	

3 Targets

The Demonstration Enterprise establishes voluntarily the following direct Energy Efficiency targets: based on 2003 (reference year), by 31st December 2005, the Demonstration Enterprise shall complete the Energy Conservation Project and achieve the energy conservation target: reduce energy consumption per unit product by 10%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product by 15%.

4 Measures for Energy Conservation

4.1 Energy Management

The Demonstration Enterprise shall enhance the energy management, establish and perfect energy management system and energy efficiency standards, and improve the internal regulations.

	Measures	Effect
1	Establish an Energy Management Department, and assign full-time staff responsible for the energy management of the Company.	Estimate increase energy

2	Formulate the energy plan, and compile monthly energy consumption table.	energy conservation rate by 1%.
3	Adopt energy consumption ration management	
4	Establish energy measuring and monitoring system.	

4.2 Common Energy Conservation Measures

	Measures	Effect
1	Use high efficiency lighting products.	Estimate increase energy conservation rate by 2%.
2	Reduce the energy consumption of transportation vehicles through rational arrangement.	
3	Use recycling office products.	
4	Use renewable energy technologies and products.	
5	Use energy-saving products, including office equipment.	
6	Adopt computer system to improve the efficiency of company management and the energy efficiency.	
7	Increase plant factor, decrease rejection rate.	
8	Improve kiln body material and structure, safeguard and overhaul regularly, reduce heat leakage of the body surface.	
9	Maintain the combustion system regularly, organize combustion rationally, execute the combustion operating condition strictly.	
10	Use electric motor with speed and frequency modulation	

4.3 Energy Conservation and Technical Innovation

In order to achieve the target of energy conservation on time, the Demonstration Enterprise shall adopt the following measures.

	Measures	Expected Energy Conservation (tce/a)	CO_2 Emission Reduction(t/a)	Time
1	The proposed waste heat power plant will utilize low-temperature (approximately 360°C) exhaust gases from the dry-process cement kiln as energy source, with no supplemental boilers. The rated capacity of the power plant is 3MW, with annual electricity generation of 21.2 million kWh, or 35 kWh per ton of clinker.	8,480.00	21,136.00	2004.1-2005.1

Basic Information of the Demonstration Enterprise

Name: Shenhe Cement Co. Ltd.				
Address: Huatai Village, Heshan, Tongxiang, Zhejiang Province				Zip: 314512
Ownership: Stock Share				Established in: 1975
Contact:			Tel:	Fax:
Information on Enterprises Quality				
Honors	Types	Name of Honors	Issued by	Date
	Nation level	National Cement Passtest Dept.	National Cement Quality Detoxification Test Center	2003.8
	Province level	Zhejiang Generally Excellent Cement-test Dept.	Zhejiang Cement Quanlity Test Center	2004.3
Certifications	Type	Name	Validation date	Products
	Quality Control System Certification	Guojian Orient Green Building Material Attestation Center Co. Ltd.	2003.11.3~2006.11.2	

Year		2001		2002		2003	
Product	Product type	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)
	32.5 42.5 Cement	38.53	8351	81.02	16906	91.38	22538
Final total capital value(10k RMB)		14,464		16,672		27,209	
Work force(p)		387		533		528	
Floor area(m^2)		63,270		87,246		180,253	

Energy Consumption						
Year	2001		2002		2003	
Energy Consumption	Quantity	Coefficient	Quantity	Coefficient	Quantity	Coefficient
Coal (t)	42,288	30,206	71,750	51,250	101,212	72,295
Electricity (10k kWh)	2,896	10,136	4,883	17,091	6,453	24,717

Annex11.5.1:

Statute of LPIC of Yingde City, Guangdong Province, for UNDP/GEF Energy Conservation & GHG Emissions Reduction in Chinese TVEs – Phase II project

General Provisions

Article 1 Local Policy Instruction Commission (hereafter LPIC) of Yingde City of Guangdong Province for UNDP/GEF Energy Conservation & GHG Emissions Reduction in Chinese TVEs – Phase II project, is an agency under the leadership of Yingde government, aiming to help TVEs to remove barriers against their adopting energy efficiency technologies.

Article 2 The mission of the LPIC is to build an efficient facilitating mechanism to promote local TVEs to adopt energy efficiency technologies, lower their comprehensive energy consumption; reduce GHG emission and promote the sustainable development and environment improvement.

Organization Structure

Article 3 LPIC is formed by members from the Government Office, Economic & Trade Bureau, Medium and Small-sized Enterprises Bureau, Environment Protection Bureau, Construction Bureau and Bureau of Land and Resources of Yingde.

Article 4 LPIC has 8 members, including the vice mayor as director, Government Office vice director, Economic & Trade Bureau director and Environment Protection Bureau director as deputy directors. The other 4 members are from Science and Technology Bureau, Construction Bureau, National Land Bureau and Medium and Small-sized Enterprises Bureau.

Article 5 Representatives of the membership organization are recommended by his/her leader in charge and approved by his/her organization. The tour of duty is 3 years. If the membership organization wants to change its representative, a written notice should be present to the LPIC and only with the approval of LPIC can the membership organization recommend new representative.

Article 6 LPIC has 1 director and 3 deputy directors. The Director is the vice mayor of Yingde. 3 deputy directors are Government Office vice director, Economic & Trade Bureau

director and Environment Protection Bureau director. If the director is absent, the deputy director should act on his behalf. Besides the general responsibilities of common LPIC member, the Director (or Deputy Directors) should preside the LPIC meeting, arrange its works and sign its official papers and meeting minutes.

Article 7 LPIC sets a standing office. The office will run the LPIC daily work, such as carrying out the requests and tasks stipulated in the LPIC papers and meeting minutes and composing work brief. The office will also build up communication system with national PMO and PIC. The Office locates at Economic and Trade Bureau and Medium and Small-sized Enterprises Bureau. The Deputy party secretary of the Economic and Trade Bureau is Office Director and the deputy director of Medium and Small-sized Enterprises Bureau is the Deputy Office Director.

Article 8 LPIC Office members consist of local policy experts, deputy party secretary of the Economic and Trade Bureau, deputy director of Medium and Small-sized Enterprises Bureau and a staff.

Responsibilities

Article 9 The main responsibilities of LPIC are: under the direction of national PMO and PIC, to facilitate the TVEs to adopt energy efficiency technologies and help them to remove policy, market, technology and financial barriers.

1. Draft and implement the Action Plan, promote the reform of energy efficiency supervision mechanism and the shifting of project implementation by adopting a market transformation approach.
2. Supervise and urge the fulfillment of Voluntary Agreement;
3. Provide TVEs with information on emission reduction technologies, policies and management; organize information exchanges between the demonstration enterprises and other involved enterprises;
4. Enforce the implementation of environment protection and energy conservation laws & regulations, standards and measures;
5. Build up incentive mechanism for energy conservation and emission reduction in TVEs.

Article 10 Responsibilities of LPIC membership organizations

1. Yingde Government Office promotes other departments to support the projects, coordinates LPIC and promotes the government to integrate LPIC work into government plan.

2. Medium and Small-sized Enterprises Bureau and Economic and Trade Bureau reports to the national PIC. As the administration agency of TVEs, it has the functions of direction, facilitation, supervision and service.

3. Environment Protection Bureau supervises the implementation of Environment Law, brings up detailed requirements for environment protection and helps the demonstration enterprises to realize standard emission.

4. As the agency administrating cement industry, Construction Bureau facilitates relevant agencies.

5. Bureau of Land and Resource provides TVEs with service on land using.

Working Procedure

Article 11 LPIC hold meetings regularly and it calls for meeting half a year. The Director presides the meeting. Relevant papers and meeting minutes should be produced after each meeting. Its decision is valid when more than half of its members participate in the meeting.

Article 12 LPIC Director can call for temporary meeting according to the requests of National PMO and PIC, or according to the problems that occur during the project implementation. Meeting minutes should be produced when necessary.

Article 13 LPIC should build up reporting system. Its meeting minutes, work progress reports and summary reports should be present to the National PMO and National PIC by telephone or Email regularly.

Supplementary Article

Article 14 The Constitution will come into force on the day when all LPIC members give their approvals after discussion; it is explained by LPIC office.

Annex11. 5. 2:

Action Plan of the LPLC of Yingde City,

Guangdong Province

1. Project background

The project of "UNDP/GEF Energy Conservation & GHG Emission Reduction in Chinese TVEs" has been funded by GEF. The aim of the project is to help Chinese TVEs that engaged in brick-making, cement, casting and coking to adopt energy efficiency technologies and to reduce GHG emission.

In the first phase of the project, which was ended in 1999, the market, policy, technical and financial obstacles to the adoption of energy efficiency technologies were evaluated and strategies to remove the obstacles have been formulated. During the second phase, it has been proposed to establish top-down LPIC both at central and local level and promote energy efficiency in Chinese TVEs by adopting a market transformation approach.

In order to realize the objectives set for the project's second phase, to create a sound environment for the demonstration enterprises and the cement industry that these enterprises belong to, to promote the implementation of policies, laws and statutes, to establish a mechanism favorable for enterprises to adopt energy efficiency and GHG emission reduction and to extend the experiences accumulated by the demonstration enterprises, The LPIC of Yingde city has formulated the action plan.

2. Major obstacles to adopting energy efficiency technologies in local cement TVEs

1) Backward Technological Structure

Among the total production capacity in Yingde city, 1.3 million tons is produced by rotary kilns, 27.8% of the total, and 72.8% by vertical kilns. The average production capacity of local enterprises is 95,000 tons, lower than the national average. All these indicate that the technological structure of local cement industry is backward. It also means high production costs and lower competitiveness.

2) Limited local market capacity

Zhujiang Delta Zone is the most developed area in Guangdong. Its cement consumption is 60 millions, accounting for 3/4 of Guangdong total. Though Yingde enjoys many advantages in terms of limestone resource and construction conditions, due to its backward economic conditions and low fix capital investment, its cement consumption is quite low, which is unfavorable to local cement industry development.

3) Low level resource utilization

The enterprises have neglected the integrated utilization of limestone resource. Many enterprises only utilize high-grade ore and ignore the lean ore, which leads to resource waste.

4) Shortage of capital

5) Transportation and logistic infrastructure need to be improved

6) Insufficient coal supply

3. Objective

(1). Objectives in the near future（2003-2005）

1) The government signs *Energy Efficiency Voluntary Agreement* with demonstration enterprises.
2) To conduct energy efficiency technologies upgrading. With 2003 as baseline, the integrated Chamotte energy consumption is to decrease by 21%.
3) To establish an effective mechanism and lay sound basis for cement industry's sustainable energy efficiency and GHG emission reduction and popularize *Energy Efficiency Voluntary Agreement*

(2) Medium and long term objectives（2006-2008）

① By 2008, the ultimate objective is to decrease integrated chamotte energy consumption by 24% with year 2003 as the baseline.

② Extend the demonstration enterprises' voluntary agreement model in the cement industry and establish enterprises' voluntary energy efficiency mechanism by adopting a market transformation approach.

4. Implementing Plan

(1) Government signs energy efficiency Voluntary Agreement with demonstration enterprises.

Time: Jan 2005—Dec 2005

Objective: government signs energy efficiency Voluntary Agreement with demonstration enterprises; with 2003 as baseline, the integrated energy consumption of chamotte decreases by 21% by year 2005 . By the end of 2008, it decreases by 24%.

Tasks:

① Consult with enterprises and formulate energy efficiency technology upgrading plans that are to be assessed.

② Make surveys of demonstration enterprises in order to identify barriers to the implementation of the plan.

③ LPIC consults with local government and formulates incentive policy;

④ Work out energy efficiency Voluntary Agreement together with demonstration enterprises;

⑤ Consult with PTPMC and RCF and provide technical and financial support;

⑥ Sign Energy Efficiency Voluntary Agreement; (See Energy Efficiency Voluntary Agreement for detailed incentive policies and EEI);

⑦ According to the stipulations of Energy Efficiency Voluntary Agreement, the implementing progress of the tasks is to be supervised by the third party that has been confirmed by the parties involved in Energy Efficiency Voluntary Agreement;

⑧ Summarize the experiences accumulated by demonstration enterprises and get ready for extending the experiences in Yingde cement industry.

(2) Confirm extended enterprises

Time: January 2006 to December 2006

Objective: LPIC extends Voluntary Agreement mechanism in Yingde

Tasks:

① Train people from local cement industry and publicize GEF project;

② Conduct survey of cement TVEs in Yingde city;

③ Collect information of TVEs that are willing to conduct energy efficiency technical upgrading;

④ Assist Beijing Hongyuan Energy and Environment Protection Ltd. to choose extended

enterprises;

⑤ Sign Voluntary Agreement with extended enterprises.

(3) Organize the TVEs that signs *Energy Efficiency Voluntary Agreement* to participate in an on-the-spot meeting and introduce their experience

Time: June 2006

Objectives: Publicize *Energy Efficiency Voluntary Agreement*

Tasks:

① Hand out energy efficiency technology upgrading pamphlets to cement TVEs and other energy-intensive enterprises

② Organize the TVEs that signs Energy Efficiency Voluntary Agreement to participate in an on-the-spot meeting and introduce their experiences.

③ Organize a workshop to discuss the possibility and barriers for adopting Energy Efficiency Voluntary Agreement in cement TVEs

④ TVEs sign Energy Efficiency Voluntary Agreements with government.

(4) Publicize Yingde cement industry

Time: Jan 2005-dec 2008

Objectives: Publicize Yingde's advantages for cement industry development, attract investment and develop market

Tasks:

Publicize Yingde's advantages for cement development in terms of resource, transportation and geographic convenience in influential media;

① Draft publicity outline;

② Write, design and shoot publicity materials;

③ Select some influential medias to publicize, such as,

Major Papers: People's Daily, Economic Daily, China Cement, etc.

Major TV: CCTV Economic Channel, Guangdong TV, etc.

Major Web: Website of Ministry of Construction (www.cin.gov.cn), China Cement Association (www.chinacements.com), China Small and Medium Enterprises (www.cnsme.com), China Township Enterprises (www.cte.gov.cn), www.sohu.com, www.sina.com, www.baidu.com, www.google.com .

(5) Improve the transportation infrastructure

Time: July, 2006-Dec 2007

Objective: Improve the transportation infrastructure and establish a complete and smooth logistic system

Tasks:

① Baseline survey on the transportation system and logistic system in Yingde;

② Present the baseline survey report to Yingde government and propose to improve the stops along Jingguang railway, to improve Yinying high road, rebuild the G253 highway, coordinate relevant agencies in other regions to improve the conditions of Beijiang river course;

③ Recommend relevant departments to organize modern and professional logistic centers and enterprises according to Company Law.

(6) Strengthen resource prospecting and development planning

Time: Sep 2005-Dec 2008

Objective: Strengthen resource prospecting and integrated utilization

Tasks:

① Baseline survey on the limestone resource prospecting and comprehensive utilization

② Present the baseline survey report to Yingde government

③ Recommend Yingde government to draw a plan on limestone resource prospecting and comprehensive utilization

(7) Government helps to facilitate coal supply

Time: Jan 2005-Dec 2008

Objective: Extend the Voluntary Agreement in Yingde City

Tasks:

Every year, local government will host a Coal Procurement Conference, participated by coal producers from Shanxi, Henan, Hunan, Guizhou and Shaoguan of Guangdong.

(8) Encourage the adoption of advanced processes and phase out the backward ones

Time: Jan 2005-Dec 2008

Objectives: the new production lines shall adopt new dry processes, which shall finish disintegration outside kiln and it can effectively reduce dirt emission

Tasks:

① The new production lines shall adopt new dry processes, which shall finish disintegration outside kiln and it can effectively reduce dirt emission.

② Phase out the heavily-polluting vertical kilns and hydro-processes according to market law.

Annex11.5.2.1:

Survey Report on the Establishment of LPIC in Yingde City of Guangdong Province for UNDP/GEF Energy Conservation & GHG Emissions Reduction in Chinese TVES – Phase II project

According to the framework and requirement of *UNDP/GEF Energy Conservation & GHG Emissions Reduction in Chinese TVES – Phase II*, a study tour group, led by Ms. Wang Guiling, PMO deputy director, consisting of subcontractor experts and technical professionals, went to Yingde city, Guangdong province and conducted a five-day tour from Nov 24 to 28, 2004 (See attachment for detailed activities and name list of the participants). Workshops, field study and questionnaire answering had been held in order to remove the market, policy, technical and financial obstacles that have been identified in the process of producing, marketing and applying energy efficiency technology in Yingde Cement industry. Another object of the tour is to direct the establishment of LPIC in the city and to promote its capacity building. In order to guarantee the quality and effectiveness of the tour, Mr. Wang Xiwu, Project PIC, was invited to participate in the tour. The field study results are as follows:

1. Brief Introduction of the Cement Industry in Yingde City

Yingde city is located in central north Guangdong province, among the middle reaches of Beijiang River, Zhujiang Delta Zone and north Guangdong.

Yingde city enjoys rich natural resources to develop cement industry because of abundant limestone reserves. By the end of 2002, it had been prospected that there are 3.18 billion tons of limestone in 59 mining sites in Guangdong province, among which 24 mining sites enjoy average reserve of more than 30 million tons. Northern Guangdong covers 36% of the total limestone reserve in the province, and 60% of the Northern Guangdong reserves are in Yingde city. With total 60-billion-ton estimated resources that are distributed in 18 sites, Yingde city is one of the most important limestone resource areas. By the end of July 2004, the prospected reserves in Yingde had reached 1.8 billion tons. The width of the limestone beds in Yingde varies from 30m to 500m, with an average width of 200m-400m, generally exposed to the erosion datum. In one word, Yingde city has many advantages in limestone mining, including convenient transportation system, large quantity of reserves, intensive distribution and easy mining conditions.

According to the *Research Reports on the Competitiveness of Nine Major Industries* (including building material industry), Guangdong province has formulated the strategy of moving the cement industry from the economic developed area (Zhujiang Delta Zone) to less developed mountainous area, and Northern, Western and Eastern parts have been specified as three cement industry bases. Among these three areas, Northern and Western parts are most important, while Yingde is the major part of the Northern base.

Cement industry in Yingde city has been the pillar industry since 1980's. By the end of 2003, Yingde had 30 cement enterprises, with each enterprise's annual turnover more than 5 million Yuan, accounting for 7% of the total number of cement enterprises in Guangdong Province. Yingde has 5 enterprises with annual production of 200,000 tons, accounting for 17% of Yingde's total production. By the end of 2002, Yingde had 55 production lines, with total production capacity 4.67 million tons. Each enterprise's production capacity reached 156,000 tons. Among the 55 production lines, 7 were rotary kilns (including 4 hydro production lines and 1 wet grinding and dry burning production line) and 48 are vertical kilns. Since 2003, because of the improved investment environment and its advantages in terms of resource, energy, geographic convenience, transportation and market, Yingde has attracted many prestigious cement producers. For example, Guangdong Hailuoshan Cement Ltd has established 4 5000t/d production lines in Longweishan limestone field and Taini Yingde Cement Ltd has established 4 5000t/d production lines in Guanyinshan limestone field.

2. Market conditions, development trends and orientation of cement industry in Yingde

1) Market conditions

In the past 30 years, cement produced in Yingde has been sold to Zhujiang Delta Zone including Guangzhou, Fushan, Dongguan, Huizhou and Jiangmen, where it earns itself a good credit for its high price and high quality. Compared to other similar products, its price is higher by 10-20 Yuan/ton. It can be said that Yingde cement has developed with the development of Zhujiang Delta Zone.

At the same time, a powerful marketing network has been formed, which is joined by many professional marketing staff. Yingde cement market has been oriented to meet the demand the Zhujiang Delta Zone and Northern Guangdong area.

2) The gap between the demand and supply of high quality rotary-kiln cement in Zhujiang Delta Zone will continue in a long time

Zhujiang Delta Zone consists of cities such as Guangzhou, Shenzhen and Zhuhai, with a total area of 41.700 km^2 and total population 43 million. In 2002, Zhujiang Delta Zone's GDP accounted for 80.02% of that of Guangdong province, with GDP per capita $4100. The estimated cement consumption in 2012 is 60 million tons, while local production capacity is only 44.65 million tons (Rotary kiln production capacity is only 4.75 million tons), with a gap of 15 million tons.

With accelerated modernization pace in this area during the next decade, the cement demand will increase to 70-75 million tons in 2010, with a gap of 30 million tons. Actually, with the industrial updating and restructuring, the traditional cement industry, especially the vertical kilns cement production, shall be phased out and the market demand for the new dry-processed cement will exceed the above-mentioned estimate.

It is possible for Yingde new dry-processed cement industry to share more than 25 million tons of the market in the Delta Zone, due to its advantages of resource, location and convenient transportation.

3. The economic development in Northern Guangdong will promote the speedy cement demand

Northern Guangdong region consists of Qingyuan and Shaoguang, which are the major cement production areas in Guangdong. However, due to its lagging economic status and low GDP, Northern Guangdong region's annual cement demand amounts to only 3 millions tons. About 20 million tons cement and chamotte have been sold to the Delta Zone every year.

Recently, Northern Guangdong has sped up its integration into the Delta Zone. The annual investment in this region has increased by 30%. The cement demanding has also increased drastically. It is estimated that in 2010, in Qingyuan city alone, the demand will reach 4-4.5 million tons.

3. Development target and schedule for Yingde cement competitiveness

1) Development strategy

① Guidelines.

Stick to the market laws and focus on the demand of Zhujiang Delta Zone; prevent investing in backward processes and encourage the investment of large enterprises and groups from home and abroad; establish a high-level cement (Chamotte) production base, which shall adopt pre-decomposition process; conserve and effectively utilize natural resources and energy; strengthen environment protection and quality control to form a fair competitive market; phase out the backward vertical kilns and hydro-production according to market demand and realize the harmonious balance between cement production, resource conservation and environment protection.

② Development direction:

Develop dry-processed cement production, phase out backward production processes and achieve sustainable development.

③ Development methodology

Encourage adopting the model of "Chamotte Base + Cement grinding station" according to marketing orientation. Based on the construction of cement grinding station, the transportation capacity shall be reasonably distributed to promote the overall competitiveness.

2) Development targets

① Development Scale

As the largest and most competitive cement (Chamotte) production base, the total regional production capacity shall reach 30 million tons in 2010, with 90% as dry-processed cement.

② Market Share: Account for 30% of the total Guangdong consumption or 45% of that of the Zhujiang Delta Zone

Major Technical and Economical Indicators:

- consumption of coal equivalent per ton of chamotte <110kg
- Comprehensive electric consumption per ton of cement<100kwh
- Overall labor productivity >3000 ton per person year

③Environment target: National Emission Standards

④Financial Requirement: 6 billion RMB Yuan is expected to be invested, including 2 billion local matching fund and 4 billion loan

⑤ Main Production indicators:

- Annual sales revenue: 6 billion Yuan,
- Annual profit: 0.9 billion,
- Average sales profit rate: 15%.
- Annual tax revenue: 0.6 billion Yuan.

4. Demonstration enterprise introduction

Yingde Baojiang Cement Material Ltd. is located at Shihui (Shihui in Chinese means limestone in English) town which is 20Km far from Yingde city. The company was built up in 1994 with a staff of 126, among which 37 are technicians. It has 2 Φ3 × 10m vertical kiln product line with a total production of 200,000 tons.

5. LPIC construction in Yingde

With deepening administrative restructuring reform, Yingde Economic and Trade Bureau has been granted the function to administrate cement production and energy conservation technical updating.

Yingde government has attached great importance to local cement industry development.

In 2004 they invited China Development Strategy Institute for Building Material Industry to formulate "*Yingde Cement Industry Development Plan*", which is the only county level plan among 2400 counties in China. The requirement for LPIC establishment and its capacity building according to **UNDP/GEF Energy Conservation & GHG Emissions Reduction in Chinese TVES – Phase II project,** conforms to *Yingde Cement Industry Development Plan* and can be easily integrated into local development streams.

Yingde government has appointed the deputy mayor who is in charge of Yingde industry development as the director of LPIC. LPIC also consists of member from Government Office, Economic and Trading Bureau, Science & Technology Bureau, Environment Protection Bureau, Financial & Local Taxation Bureau and Yingde Branch of Agricultural Bank of China. LPIC's mission is to organize and facilitate energy conservation and emission reduction technical upgrading in Yingde, to help local cement enterprises to remove market, policies, technical and finance obstacles.

6. Preferential policies

1) Preferential tax policies

① For every newly built production enterprise, local Bureau of Finance will transfer 30% of the added local taxation to the industrial zone developer; The developer can reward part of the transfer to the enterprise for its reproduction and infrastructure improvement.

②Foreign-funded enterprises (including those invested by residents from Hong Kong, Macao and Taiwan) can enjoy the following preferential treatments:

- Reduction or exemption of housing property tax,
- Exemption of the land holding tax,
- Exemption of city maintenance construction tax and added education tax, and
- Exemption of local income tax.

③ Business Income Tax (for domestic-funded enterprises) will be collected according to two grades:

- For those enterprises that the annual income is lower than 30,000 Yuan (included), the income tax rate is 18%;
- For those that the annual income is between 30,000-100,000 (included), the income tax rate is 27%.

Both of them are lower than current tax rate of 33%.

④Value-added tax refund policy for resource integrated utilization

According to "*Circular on Value-added Tax Policy for Some Integrated Utilized*

Resources and Products", which was issued by Ministry of Finance and the State Administration of Taxation (Caishui[2001]198), *"from Jan 1 2001, the collected value-added tax on cement produced with at least 30% coal slack, stone coal, pulverized fuel ash and coal stove waste (excluding blast furnace granulated slag) and other waste shall be exempted"*. This policy has been positively implemented in Yingde.

2) Preferential Stipulated Fee Treatment

①For foreign-funded enterprises or those enterprises that are invested by investors from other regions, no stipulated fees will be charged except the taxes.

② Preferential policy for water use. For foreign-funded enterprises or those enterprises that are invested by investors from other regions, no registration fee will be charged for industrial water using and the water price will be under 0.9 Yuan. For those big water consumers, approved by local Industrial Park Administration, other relevant functional departments and local government, water plant can be built or underground water can be pumped according to laws, regulations and technical requirements, and water resource fee and wastewater disposal fee shall be exempted.

③ Preferential policy for electricity use. For foreign-funded enterprises or those enterprises that are invested by investors from other regions, local registration fee for industrial electricity utilization shall be exempted and the price will be under 0.45 yuan/Kwh.

3) Encourage Small Hydropower plant construction. Yingde government encourages the development of small hydropower. The small hydropower plants built by the enterprises shall first meet their own demand and then the surplus power can be delivered to the grid. The grid cost is reduced or exempted.

7. Existing Problems

1) Backward Technological Structure

Among the total production capacity in Yingde city, 1.3 million tons is produced by rotary kilns, 27.8% of the total, and 72.8% by vertical kilns. The capacity of Nanhua Cement Company's hydro-grinding and dry-burning production line is the biggest, about 1700t/d. The average production capacity of local enterprises is 95,000 tons, lower than the national average. All these indicate that the technological structure of local cement industry is backward. It also means high production costs and lower competitiveness.

2) Limited local market capacity

Zhujiang Delta Zone is the most developed area in Guangdong, with GDP per capita 3-10 times of that of the eastern, western and northern Guangdong. Its cement consumption is 60 millions, accounting for 3/4 of Guangdong total. Though Yingde enjoys many advantages in terms of limestone resource and construction conditions, due to its

backward economic conditions and low fix capital investment, its cement consumption is quite low, which is unfavorable to local cement industry development.

3) Low level resource utilization

Cement industry relies on the availability of limestone resource. Conservation and effective utilization of resource is the basic principle that should be abided by during the cement industry development. Before 2002, all cement enterprises suffered from years of loss. Among 30 enterprises that are located in Yingde, 5 are provincial or prefecture-level enterprises, 25 are local level and 1 is joint-ventured. In 2003, 3 enterprises were bought by famous Hailuo Group and Taini Group. Other enterprises have been rent or run by individuals. The multi ownership structure and long time of loss has led to the waste and neglect of the integrated utilization of limestone resource.

4) Shortage of capital

According to the policies related to cement industry, huge quantity of capital is needed for Yingde cement industry development and the shortage of find has become the biggest barrier.

5) Transportation and logistic infrastructure need to be improved

As a kind of bulky building material, cement suits for short distance transportation. Cement industry development has greatly relied on transportation system. It also has high requirement for logistic service. Though Yingde enjoys convenient highway, railway and river network, due to its backward economic conditions, it still has a long way to go to improve its transportation infrastructures.

6) Insufficient coal supply

Guangdong has scarce coal resource. Every year, 96% coal needed is imported. According to the *Yingde Plan*, the annual coal demand will be 3-3.2 million tons after the base building. So coal supply is an important factor for the cement base development.

8. Countermeasures

1) Publicize Yingde's advantages for cement development and attract investment

① Publicize Yingde's advantages for cement development in terms of resource, transportation and geographic convenience;
② Establish complete infrastructures to attract investment;
③ Welcome investors who has high credit and sound financial background;
④ Improve the transportation network, such as improve the stops along Jingguang railway and Yinying highway, rebuild the G253 highway, and coordinate relevant agencies in other regions to improve the conditions of Beijiang river course.

2) Strengthen resource prospecting

The estimated limestone reserves in Yingde are 60 billion tons. However the prospected reserves are only 1.8 billion tons by mid-2004. It is quite necessary to speed up local limestone prospecting work.

3) Build a complete logistic system

It is estimated that the annual material circulation will be 35 million tons after the construction of the cement base. Yingde will coordinate railway and other related transportation enterprises to organize a professional logistic center

4) Government will help to facilitate the coal supply

Every year, local government will host a Coal Procurement Conference, participated by coal producers from Shanxi, Henan, Hunan, Guizhou and Shaoguan of Guangdong.

5) Encourage the adoption of advanced processes and phase out the backward ones

Measures shall be taken to prevent or reduce negative environment impacts brought by vertical kilns. Although the production scale of the new cement base shall be 10 times bigger than that of the current level, the new production lines shall adopt new dry processes, which shall finish disintegration outside kiln and it can effectively reduce dirt emission. If the heavily-polluting vertical kilns and hydro-processes can be phased out by 2010, the pollution caused will not be worsened because the total dirt emission of the new base will be lower than current level.

6) Policy support for the cement base construction

- Form Special Fund for cement development and promote the base construction;
- Continue the supporting policies in land using, energy using and water using.

Annex11. 5. 3:

Energy Efficiency Voluntary Agreement

BETWEEN

Government of Yingde City, Guangdong Province
(Hereinafter referred to the Government)

AND

Baojiang Cement Material Co. Ltd. in Yingde City, Guangdong Province
(Hereinafter referred to the Demonstration Enterprise)

1. Background

1.1 Energy Efficiency Voluntary Agreement is an agreement that is entered voluntarily by and between a trade organization or individual enterprise and the government in order to improve energy efficiency and reduce greenhouse gas emissions. Industry organizations or enterprises commit to meet the target of energy efficiency or GHG emission reduction, and the government provides preferential policies and/or other incentives to the industry organizations and the enterprises.

1.2 The Project of "Energy Conservation and Greenhouse Gas (GHG) Emissions Reduction in Chinese Township and Village Enterprises ("TVEs") – Phase II, sponsored by the GEF, was implemented by the United Nations Development Program (UNDP), and executed by the Untied Nations Industrial Development Organization (UNIDO) and Ministry of Agriculture (MOA) of the People's Republic of China. The purpose of the Project is to help Chinese township enterprises to adopt efficient energy conservation technologies and reduce the greenhouse gas emission from brick industry, cement industry, casting industry, and coke industry in China.

1.3 In order to formulate and implement action plans to promote regulatory reforms and commercialization of energy efficiency technologies and projects among TVEs, the Energy Conservation Voluntary Agreement is formulated so as to improve energy efficiency, reduce greenhouse gas emissions and carry out the national "medium-and-long-term special energy efficiency layout" in respect of generalization of the spirit of Energy Conservation Voluntary Agreement.

2. Targets of Energy Conservation

2.1 Through the Voluntary Agreement implement, the Government shall fulfill the transformation of governmental function and explore a new mechanism aimed to achieve the same energy conservation goal but without compulsory commands. Furthermore, the Demonstration Enterprise shall reduce production cost, improve product quality, protect environment, and thus, establish a better public image for the enterprise.

2.2 The Demonstration Enterprise establishes voluntarily the following direct Energy Efficiency targets: based on 2003 (reference year), by 31st December 2005, the Demonstration Enterprise shall complete the Energy Conservation Project and achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 21%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 24%.

Indirect Energy conservation: through improving product quality, saving raw material, reducing the proportion of cement in concrete, prolonging product life, energy can be indirectly conserved.

2.3 Because the government adopts stricter environmental standard and more energy is consumed, the targets shall be adjusted if the conditions occur.

3. Measures for Energy Conservation

3.1 In order to fulfill the target of Energy Conservation on time, the Demonstration Enterprise shall establish a concrete Energy Conservation Plan, which shall be reviewed and approved by the Government, and implement the plan carefully.

3.2 The Demonstration Enterprise shall enhance the energy management, establish energy management system and energy efficiency standards, improve the internal regulations, improve employee's consciousness of energy conservation, assign full-time energy manager to be responsible for the energy management.

4. Preferential Policies

4.1 The Government shall take the Demonstration Enterprise as a key supporting enterprise. The support includes imbursement on scientific research, technological innovation, and environmental protection, and implementation of the national policy on tax reduction or exemption related to utilization of wastes such as waste residue and other national or local encouragement policies and measures for energy conservation and environmental protection. Depreciation acceleration can be applied to the equipment in the Clean Production List. Energy audit and training expense for the Energy Conservation Project can be included in the management cost. The proportional limit of cost of R&D on energy conservation can be increased and included in the management cost.

4.2. The Government committed to assist the Demonstration Enterprise in solving financing problems such as financing difficulties through the governmental credit system for medium- and small-scale enterprises and to recommend the Demonstration Enterprise to apply for recycling fund loan and other commercial loans, which will be used in the energy conservation project.

4.3. After the Demonstration Enterprise signs the Voluntary Agreement, the Government shall promise to recommend for the pilot program as well as award the honorable title to the Demonstration while introducing and extending the experience of the Demonstration Enterprise in the pilot on media.

5. Monitoring and Assessment

5.1 The Government shall submit an Annual Report on implementation of the Voluntary Agreement to the PIC in the first quarter of the year and receive the instruction from the PIC.

5.2 The Demonstration Enterprise agrees to receive assessment of the effect of the Voluntary Agreement implementation by a Technical Team established by an independent third party.

5.3 In the valid period of the agreement, the Demonstration Enterprise shall submit an annual Supervision Report to the Government and the Technical Team in written form in the first quarter every year, and submit the final report in the first quarter in the next year after the Agreement ends. The report shall include: production statistics, energy consumption data, status of implementation of Energy Conservation Plan and Energy Conservation Project, effect of energy conservation, problems and barriers, plan for the next year, measure adjustment, experiences and lessons, and suggestion for perfecting the Voluntary Agreement.

5.4 The Technical Team is responsible for evaluation in the implementation of the agreement, including the evaluation of the Energy Conservation Plan, Annual Monitoring Reports, the Interim Report, and the Final Report submitted by the Demonstration Enterprise. The Technical Team shall inform the assessment result in writing to the Government and the Demonstration Enterprise. The assessment report shall cover evaluated comments on the authenticity of data, the Energy Conservation Plan and projects of the Demonstration Enterprise, the status to meet the targets, and the suggestion on Agreement modification.

5.5 If the Evaluation Report indicates that the Demonstration Enterprise failed to meet the requirement that the Agreement defines, the Demonstration Enterprise shall adopt measures including identifying problems, seeking new energy conservation measures, improving the energy conservation efforts in the next year, modifying energy conservation plan, based on the advice from the Technical Team.

6. Modifications and Termination

The agreement shall be modified or terminated if the following conditions occur:

- ✧ The Laws, Regulations, or policies related to energy or environmental protection have big changes compared with the year when the agreement is signed.
- ✧ Implementation of the Agreement has negative impact to the development or normal operation of the Demonstration.

The agreement shall come into force from the date it is signed and be invalid on 31st Dec, 2008. Any pending matters in the agreement shall be discussed jointly between parties and an additional agreement shall be entered and being equally valid.

Government of Yingde City, Guangdong Province (seal)	Baojiang Cement Material Co. Ltd. in Yingde City, Guangdong Province (seal)
Authorized representative	Authorized representative
Date:	Date:

Appendix:

Baojiang Cement Material Co. Ltd. in Yingde City, Guangdong Province

Energy Conservation Plan

1 Brief Introduction of the Enterprise

Located in Shihuipu County, Yingde City, Guangdong Province, 20 kilometers far away from Yingde urban district, established in 1994, the Company has 126 employees, including more than 37 technical staff. The company has two $\Phi 3 \times 10$m vertical shaft kilns with a capacity of 200 kilo tons of Portland Cement.

2 Energy Consumption of the Enterprises

Energy Consumption in 2003

Type of Energy	Consumption Quantity	Coefficient	In tce	CO_2 Emission (t-CO_2)
Raw Coal	33,632(t)	0.7857	26,424	65,875
Electricity	8,195,270 (kWh)	3.383×10^{-3}	3,138.8	3,129
Total			29,562.8	69,004
Clinker production (t)			198,000	
Clinker coal consumption per unit product(tce/t)			0.133	
Clinker electricity consumption per unit product(kWh/t)			41.39	
Clinker Energy Consumption per unit product (tce/t)			0.149	

3 Targets

The Demonstration Enterprise establishes voluntarily the following direct Energy Efficiency targets: based on 2003 (reference year), by 31st December 2005, the Demonstration Enterprise shall complete the Energy Conservation Project and achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 21%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 24%.

4 Measures for Energy Conservation

4.1 Energy Management

The Demonstration Enterprise shall enhance the energy management, establish and perfect energy management system and energy efficiency standards, and improve the internal regulations.

	Measures	Effect
1	Establish an Energy Management Department, and assign full-time staff responsible for the energy management of the Company.	Estimate increase energy

2	Formulate the energy plan, and compile monthly energy consumption table.	conservation rate by 1%.
3	Adopt energy consumption ration management	
4	Establish energy measuring and monitoring system.	

4.2 Common Energy Conservation Measures

	Measures	Effect
1	Use high efficiency lighting products.	Estimate increase energy conservation rate by 2%.
2	Reduce the energy consumption of transportation vehicles through rational arrangement.	
3	Use recycling office products.	
4	Use renewable energy technologies and products.	
5	Use energy-saving products, including office equipment.	
6	Adopt computer system to improve the efficiency of company management and the energy efficiency.	
7	Increase plant factor, decrease rejection rate.	
8	Improve kiln body material and structure, safeguard and overhaul regularly, reduce heat leakage of the body surface.	
9	Maintain the combustion system regularly, organize combustion rationally, execute the combustion operating condition strictly.	
10	Use electric motor with speed and frequency modulation	

4.3 Energy Conservation and Technical Innovation

In order to achieve the target of energy conservation on time, the Demonstration Enterprise shall adopt the following measures.

Measures	Expected Energy Conservation (tce/a)	CO_2 Emission Reduction(t/a)	Time

1	The Company will construct a 2,500 t/D new dry cement production line to replace the two old shaft kilns, with an annual production of 775 kilo tons of Portland cement clinker. Clinker coal consumption per unit product is 111.43 kgce/t, clinker electricity consumption per unit product is 60.00 kWh/t, smoke dust emission is LEQ 50 mg/Nm3 ,SO2 emission is LEQ 400 mg/Nm3, NOx emission is LEQ 400 mg/Nm3 m. The new line will consist of a Φ 4 × 60m rotary kiln and a pre-calcinator with a 5-stage low pressure cyclone pre-heater. An advanced DCS controlling system will be adopted to monitor and control the operation of the production line.	6,208.19	16,560.96	2004.1-2005.12

Basic Information of the Demonstration Enterprise

Name: Baojiang Cement Material Co. Ltd.							
Address: Shihuipu County, Yingde City, Guangdong Province						Zip: 513046	
Ownership: Limited liability						Established in: 1994	
Contact: Liu Guansheng				Tel: 0763-2601168		Fax: 0763-2601163	
Information on Enterprises Quality							
Honors	Types	Name of Honors		Issued by		Date	
	Nation level						
	Province level						
Certifications	Type	Name		Validation date		Products	
	Quality Control System Certification	ISO9002		2000		Portland Cement	
Year		2001		2002		2003	
Product	Product type	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)
	Clinker	126,886.30	1,903.00	156,564.06	2,427.00	198,000	4,022.00
Final total capital value(10k RMB)		6,561		6,819		6,932	
Work force(p)		113		120		120	
Floor area(m^2)		166,451		166,451		166,451	
Energy Consumption							
Year		2001		2002		2003	
Energy Consumption		Quantity	Coefficient	Quantity	Coefficient	Quantity	Coefficient
Coal (t)		26,296	0.7857	29867	0.7857	33,632	0.7857
Electricity (10k kWh)		710.585		8063824		819.527	

Annex 11.6.1:

Statute of Tieshan Policy Implementation Committee

Introduction

Clause 1 Nature

Tieshan Policy Implementation Committee (hereinafter referred to as Tieshan LPIC) is an institution led by the Tieshan district government, which is established to help cement TVEs in the district to remove policy barriers in applying energy efficient technologies.

Clause 2 Objective

The objective of Tieshan LPIC is to promote energy efficient technologies in the cement industry, and to reduce energy consumption and emissions reduction by means of effective management mechanism while manufacturing quality energy efficient products. It is aimed to drive the sustainable development of TVEs and environmental improvement in the district.

Organization of Tieshan LPIC

Clause 3 Member organizations

Tieshan LPIC is comprised of representatives from the District Government Office, the District Bureau for Planning, Statistics and Pricing, the District Bureau for Economic Development, the District Bureau for Science and Technology, the District Bureau for Environmental Protection, the District Finance Bureau, the District Bureau for Agriculture, Luzhanshan

Community Committee and ABC Tieshan Office.

Clause 4 Delegates

Tieshan LPIC shall have 9 delegates, who should be directors of the above-mentioned 9 local government authorities.

Clause 5 Term of service

Tieshan LPIC delegates, to be nominated by the district government, shall serve a term of three years. If any member organization wishes to delegate its membership to a delegate from within the same office as the actual member, a written application of such delegation should be submitted to the district government for approval.

Clause 6 LPIC Directors

The standing deputy district governor shall take the post of Director, and the assistant of the district governor shall take the post of Standing Deputy Director. Two deputy district governors shall take the post of Deputy Directors. The Standing Deputy Director can act as Director in his absence. In addition to the normal duties and obligations of a member of Tieshan LPIC, the Director (or acting Director) chairs meetings of Tieshan LPIC, signs Minutes and formal correspondence of Tieshan LPIC.

Clause 7 LPIC Office

The Tieshan LPIC Office is responsible for the administrative routine activities of Tieshan LPIC and communications with the PIC and the project management office of the UNDP/GEF Chinese TVEs Project. The Office is established within the District Government Office at the address of No. 1, Tieshan Ave., Tieshan District, Huangshi City.

Clause 8 Office staff

The office staff includes experts in local policy issues, deputy director of the District Government Office, and the Standing Deputy Director of Tieshan LPIC.

Functions of Tieshan LPIC

Clause 9 The major responsibility of Tieshan LPIC is to promote, under the guidance and with the coordination of the national PIC and the national project authority, energy efficient technologies in the cement industry of the district, and to remove policy barriers encountered in the process.

1. Tieshan LPIC will develop and implement action plan aimed at promoting regulatory reform with TVEs in the district, and market transformation of energy efficiency technology and projects.
2. Tieshan LPIC will promote Energy Efficiency Voluntary Agreement (VA) to be signed by and between the local government and TVEs.
3. Tieshan LPIC will regularly provide TVEs with information about updated energy efficient technologies and related policies both inside and outside China.
4. Tieshan LPIC will promote in the district better enforcement of existing national policies for technical upgrading, energy conservation and environmental protection.
5. Tieshan LPIC will establish incentive mechanism to promote energy efficient technologies, and have best practices in energy conservation and emissions reduction replicated throughout the district.
6. Tieshan LPIC will recommend to the national PIC rewards to organization(s) or individual(s) with remarkable performance.

Clause 10 Responsibilities of member organizations

1. The District Government Office together with the District Bureau for Agriculture and Luzhanshan Community Committee assumes the responsibility of organization and coordination activities.
2. The District Bureau for Planning, Statistics and Pricing, the District Bureau for Economic Development, the District Bureau for Science and

Technology and the District Finance Bureau is responsible to provide technical support to cement TVEs applying energy efficient technology.

3. The District Bureau of Environmental Protection will provide guidance to cement TVEs in the aspect of policies and emissions standards, and will conduct environmental evaluation of the TVEs.
4. ABC Tieshan Office takes the responsibility to assist cement TVEs in sourcing funds for technical upgrading.

Governance and working procedures

Clause 11 Modality of operation

Tieshan LPIC will operate by means of meetings, once half a year. The Director, or the Standing Deputy Director in his absence will chair the meetings. A meeting will be considered duly valid if more than 50% of its members are present.

Clause 12 Interim meetings

The LPIC Director may call interim meetings as per the request of PIC, and the PMO.

Clause 13 Reporting system

Minutes of meetings and progress reports will be submitted to the national PIC on a regular basis.

Supplementary Articles

Clause 14 This statute will become effective after it is discussed and approved by all LPIC members. Tieshan LPIC reserves the right for the explanation of this statute.

Annex 11.6.2:

Action Plan of the LPIC of Tieshan district,

Huangshi city of Hubei Province

1. ProjectBackground

The project of "UNDP/GEF Energy Conservation & GHG Emission Reduction in Chinese TVEs" has been funded by GEF. The aim of the project is to help Chinese TVEs that engaged in brick-making, cement, casting and coking to adopt energy efficiency technologies and to reduce GHG emission.

During the project's first phase that was finished in 1999, the market, policy, technical and financial obstacles to the adoption of energy efficiency technologies have been and evaluated and strategies to remove the obstacles have been formulated.

During the second phase, it has been proposed to establish top-down LPIC both at central and local level and promote energy efficiency in Chinese TVEs by adopting a market transformation approach.

In order to realize the objectives set for the project's second phase, to create a sound environment for the pilot enterprises and the cement industry that these enterprises belong to, to promote the implementation of policies, laws and statutes, to establish a mechanism favorable for enterprises to adopt energy efficiency and GHG emission reduction and to extend the experiences accumulated by the pilot enterprises, The county-level PMC of Tieshan district has formulated the action plan.

2. Obstacles to Adopt Energy Efficiency Technologies

For Tieshan district's cement industry, the market, policy, technical and financial obstacles to adopting energy efficiency technologies are as follows:

① The poor-quality cement produced by the vertical kiln has been forbidden to be used in major architectural projects and shall be gradually rejected by the market;

② Enterprises have difficulties in collecting enough fund for technical upgrading.

3. Objective

(1) Objectives in the near future（December 31,2003-- 2005）

① The government sign Energy Efficiency Voluntary Agreement with pilot enterprises.

② To upgrade the energy efficiency technologies and to realize the objective of decreasing the energy efficiency index by 10% (with the data of 2002 as baseline)

③ Establish an effective mechanism, extend Energy Efficiency Voluntary Agreement and lay basis for cement industry's sustainable energy efficiency and GHG emission reduction;

(2) Medium and long term objectives（2006-2008）

① In 2008, compared with the data of 2002 (baseline), the ultimate objective of decreasing EEI by 15% in pilot enterprises shall be realized.

② Extend the pilot enterprises' voluntary Agreement model in cement industry in Tieshan district and Huangshi city and to establish enterprises' self-improving mechanism to promote energy efficiency by adopting a market transformation approach.

3. Implementing Plan

(1) Lufeng CementCompany of Hubei province signs EE Voluntary Agreement

Time: July 2003—December 31, 2005

Objective: government signs energy efficiency Voluntary Agreement with pilot enterprises; EEI decrease by 10% compared with that of baseline year 2002; EEI decrease by 15% in 2008.

Tasks:

① Consult with local government and formulate incentive policy;

② Work out energy efficiency Voluntary Agreement together with pilot enterprises;

③ Consult with PLC and RCF and provide technical and financial support;

④ Sign Energy Efficiency Voluntary Agreement; (See Energy Efficiency Voluntary Agreement for detailed incentive policies and Energy Efficiency indexes);

⑤ According to the stipulations of Energy Efficiency Voluntary Agreement, the implementing progress of the tasks is to be supervised by the third party that has been confirmed by the parties involved in Energy Efficiency Voluntary Agreement;

⑥ Summarize the experiences accumulated by pilot enterprises and get ready for extending the experiences in Jiangning district's casting industry;

(2) Help pilot enterprise to finance

Time: 2003— 2005

Objective: Assist the enterprises to raise fund for technical upgrading

Tasks:

① Assist the pilot enterprises to apply for the fund of the project "UNDP/GEF

Energy Conservation & GHG Emission Reduction in Chinese TVEs" and make good use of the project fund in order to guarantee the feasibility of the project.

② Local governments play an active role in the second phase of the project:

a. Try to win credibility surety fund and technical upgrading fund for medium and small-scale enterprises.

b. Strengthen the publicity and coordinate the relation between banks and enterprises. Introduce foreign fund to the project and formulate preferential land and tax policies

(3) Favorable policies for those enterprises that conduct energy efficiency

① Accelerate the examination and approval of the production projects that can promote energy efficiency. For those technical upgrading projects that conform to national industrial policies, Economy and Trade Commission, Science Commission and Environment Protection department shall support and accelerate its examination and approval.

② Accelerate the depreciation of those equipments listed in government's clean production catalogue. The cost used for energy auditing and training is to be listed in enterprises' running expenses.

③ Those enterprises that signs Voluntary Agreement with governments can directly get pollutant discharge certificate

④ The proportion of the cost incurred for researching and developing technologies for energy efficiency and GHG emission reduction shall be increased and included in overhead expenses.

(4) Extend Voluntary Agreement

Time: 2007

Objective: Extend Energy Efficiency Voluntary Agreement mechanism

Tasks:

① LPIC sends notices on promoting Energy Efficiency Voluntary Agreement among building materials industry in Tieshan District and cement enterprises in Huangshi city.

② LPIC accepts the enterprises' application for implementing Energy Efficiency Voluntary Agreement.

③ LPIC recommends potential pilot enterprises to PMO.

④ LPIC assists the government to sign Energy Efficiency Voluntary Agreement with enterprises.

(5) Conduct Energy Efficiency Publicity Month in Tieshan district

Time: December 2005

Objective: Publicize the concept of Energy Efficiency and extend Energy Efficiency Voluntary Agreement in order to reduce CO2 emission.

Tasks:

① Take an example of the pilot enterprise that sign Energy Efficiency Voluntary

Agreement and make a TV program, named Energy efficiency and emission reduction in Tieshan district, and broadcast the program on local channel.

② Print 5000 pamphlets and distribute them among large and medium enterprises and in downtown areas.

③ Organize on-the-spot meeting to introduce the typical enterprises that conduct energy efficiency and introduce their experiences.

④ In April 2007, train those enterprises that are willing to sign Energy Efficiency Voluntary Agreement with government and recommend potential pilot enterprises to PMO according to project requirements.

(6) Energy efficiency education among children from primary and middle schools

Time: July 2004 - August 2004-3-6

Objectives: To instill the children that come from the hometown of cement with ideas of energy efficiency and environment protection and enable them to get some simple knowledge on energy efficiency and waste air emission reduction.

Tasks:

① Select 3 primary schools and 2 middle schools in Tieshan district as pilot schools.

② Conduct Popular Science Week on Energy Efficiency among pilot schools.

③ Elect "Energy Efficiency Guard" in every class in pilot schools.

④ Organize the Energy Efficiency Guards to visit the pilot enterprises and other pollution enterprises.

⑤ Energy Efficiency Guards introduce their impressions to classmates.

Annex11.6.2.1:

Report on Study Tour of Establishing LPIC in Tieshan District, Huangshi City, Hubei Province

According to the framework and plan of "UNDP/GEF Energy Conservation & GHG Emission Reduction in Chinese TVEs Project", in order to promote the energy efficiency technology adoption during the production and marketing of Tieshan cement industry, to help them remove the obstacles in their market, policies, technology and financing and to direct the establishment of LPIC in the county and promote its capacity building, a study tour group, led by Ms. Wang Guiling, PMO deputy director, consisting of Ms. Wang Hui, subcontractor manager, subcontractor experts and technical professionals, went to Tieshan District, Huangshi City, Hubei Province. The group conducted workshops, on-the-spot investigation and questionnaire answering activities from September 16 to 20, 2003 (See attachment for detailed activities and name list of the participants).

1. Brief Introduction of Cement Industry of Tieshan District

Tieshan district of Huangshi city, Hubei province, is located on the south bank of central Yangtze River. It is one of central China's major raw material industry bases. The district enjoys convenient transportation network. It is only 60 km away from Wuhan city and 23 km away from Yangtze River's wharf. The 106th national level road runs across the district. It covers a total area of 28km^2 and the whole population is 70 thousand.

Table 1: Basic Data on Cement Industry in Tieshan District

		Cement industry		Construction Materials Industry		TVEs	
		2001	2002	2001	2002	2001	2002
Number of enterprises		4	4	26	23	52	57
Total output value	10,000 Yuan	13011	13671	15307	17089	63280	74000

It is indicated in table 1 that in 2002, the total output value of the TVEs in the district was 740 million Yuan, among it 137 million was produced by cement industry,

accounting for 18.5% of the total TVE's output. It can be seen that cement industry is one of the leading TVE industries in Tieshan district.

Tieshan district enjoys rich limestone resource and the total reserve value amounts to 220 million tons. The content of CaO is more than 50%. The total output value of cement industry in Tieshan district accounts for 80% of the construction materials industry's output and is the leading industry of Tieshan district. There are four vertical kiln cement factories in Tieshan district, producing 1 million tons of cement every year, total output value cement production amounting to 137 million Yuan.

Cement industry is not only the big source of output value in the Construction Materials Industry, but also the big energy consumer. In year 2002, the energy consumed amounted to 116,000 tons of coal equivalent, while the CO_2 emission was 291,000 tons. The energy efficiency and CO_2 emission reduction technological reform in this district has profound effect on local environment protection.

Table 2: Energy Consumption and CO_2 Emission of Cement Industry in Tieshan District

	Unit / Year	2001	2002
Output	10,000 tons	78.01	85.44
Energy consumption Per Unit	Kg of coal equavilent / ton	136.24	136.14
Total energy consumption	10,000 tons of Coal equavilent	10.6	11.6
CO_2 em ission	10,000 Tons	26.6	29.1

2. Brief Introduction of the Pilot Enterprise

The pilot enterprise, Lufeng Cement Co. Ltd, Lufeng Group of Huangshi city, Hubei Province, is located in Tieshan district of Huangshi city. It is a collective-owned cooperative shares system company founded in October 1995 and the total registered capital is 20 million Yuan. There are 652 staffs employed by the company. Lufeng Cement Company has its own limestone mine and clay mine. It also utilizes rich local copper ore dregs and steel slag produced by Wuhan Steel Company. By now, there are 4 Φ3×11M mechanical vertical kiln cement production lines, producing 440,000 tons cement of P.O32.5, P.O42.5, P.S32.5 varieties.

By the end of 2002, the asset of the company has been 79.73 million Yuan, total liability 32.07 million Yuan and the rate of liability is 40.22%. 437, 000 tons of cement is produced annually and annual sales income is 67.59 million Yuan and profit is 5.72 million Yuan. The company has passed ISO9002-94 certification and been appraised as AAA credibility enterprise.

Among the total cement produced in the whole district, Lufeng Cement Company, the largest cement producer in Tieshan district, accounts for 51.2%.

Since 2001, the total investment of the company in technical upgrading and environment protection has amount to 13.80 million Yuan, annual average input is 7.4 million Yuan;

Table 3: Production of Lufeng Cement Company in 2002

	Unit	Cement industry in Tieshan District	Lufeng Cement Company	Percentage of Lufeng to cement industry in the district
Total output vale	10,000 yuan	13671	6759	49.4
Total output	10,000 Tons	85.4	43.7	51.2
People employed		1332	652	49.0

During the second phase, the company shall close 4 vertical kilns. The 8 ball milling machines shall be used to rebuild 2 new dry process cement rotary kiln, which will save energy, increase the cement quality and fire resistance. Chamotte coal consumption rate is 121kgce/t, cement comprehensive electricity consumption rate is 80kwh/t and cement comprehensive energy consumption rate is 129kgce/t. Calculated on the base of 2002 production, the annual energy saving is 8,313tce. The total investment will be 180 million Yuan。This will improve products' quality and promote local energy efficiency and CO_2 emission reduction.

3. The Administration of Tieshan Cement Industry and the Establishment of LPIC

With further institutional reform, the local TVEs Bureau, Medium and Small Scale Enterprises Bureau, Economy and Trade Bureau and Construction Materials Bureau have been integrated as Tieshan District Economic Development Bureau. Cement industry and its energy efficiency technology upgrading has belonged to local Economic Development Bureau.

Tieshan district government has attached great importance to the development of cement industry. In 2001, it was clearly stipulated in local "Tenth Five-Year Plan" that great efforts should be made to promote cement industry's energy efficiency, environment protection and technical upgrading during the five-year period. The "UNDP/GEF Energy Conservation & GHG Emission Reduction in Chinese TVEs Project- Phase II" has specified the requirement of establishing LPIC and building its capacity. This requirement conforms to local government's development planning for cement industry. It also specifies objectives, schedule and implementation approach for cement industry's energy efficiency and GHG emission reduction. The implementation of the project shall promote the progress of local energy efficiency.

Local government has paid much attention to the implementation of the project. LPIC has been established, headed by the deputy district director and constituted by members from local Planning and Statistics Bureau, Economic Development Bureau, Science and Technology Bureau, Finance Bureau, Bureau of Agriculture, Forestry and Water Affairs, Office under Tieshan Branch Bank of Agriculture. LPLC is responsible for organizing and coordinating local energy efficiency activities.

4. Property Right of Cement industry in Tieshan District

At the early phase of property right reform, most cement factories were collectively owned. With reform further on, in 1998, most TVEs' property right was changed into cooperative shares system and then Limited Corporation. Among the present 4 cement companies in Tieshan district, 1 is collectively owned (established by farmers from town, village or villager groups), 1 is joint-stock limited company (established and invested according to law by stockholders and the responsibility of stakeholder is limited to the amount of his shares). and the other two are cooperative shares company.(based on cooperation and jointly funded by the employees, certain amount of societal investment is absorbed and conducts the mechanism of autonomous management, responsibility for its profits or losses, labour in common, democratic management, distribution according to workload and dividends distributed in proportion to shares) The pilot enterprise is a cooperative shares company.

With economic development, the property right of cement producers in Tieshan district has undergone further reform. Taking an example of Lufeng Cement Company, it is conducting financial assessment. 70% stock owned by Lufeng Group Company and 30% owned by Lufeng Mining Co. Ltd have been sold to managers, employees and other individual investors. The property right reform shall effectively promote the

sustainable development of the enterprise.

5. Relevant Cement Industry Policies in Tieshan District

1) Added-value Tax Reimbursement Policy for Comprehensive Resource Utilization

According to *Notice on Added-value Tax for Some Comprehensive Utilized Resources and Other Products*, which has been issued by Ministry of Finance and State Tax Administration on December 1, 2001, "since December 1, 2001, the added-value tax, which is levied on cement that in the process of protection, not less than 30% gangue, stone coal, pulverized fuel ash and furnace cinder (not including water granulated slag in the furnace) and other waste residues is mixed into the raw materials, is reimbursed. "

This policy has been effectively implemented in Tieshan district. In Lufeng Cement Company, the amount of the reimbursed added-value tax reached 7 million Yuan

2) Vertical Kilns Cement Products not to be Used in Important Project

According to *Notice on Promoting the Management of Cement Use in Architectural Work*, which was jointly issued by Hubei Construction Department, Transportation Department, Water Affairs Department, Safe Production Supervision Office on August 26, 2002 and the *Supplementary Notice on Promoting the Management of Cement Use in Architectural Work*, which was issued in December, 2002, it is stipulated that: The architectural works must use cement that conforms to national standards and cement produced in rotary kiln (not including hollow rotary kiln). Cement produced by vertical kiln is forbidden to be used.

The specific stipulations of these documents are as follows:

"—Major large and medium constructional projects that are included into national and provincial annual plan;

—The urban civil projects and commercial concrete that requires the strengthen level of concrete reach C35;

—The structural parts of the prefabricated cement products;

—The foundation and framework of the large and medium scale constructional projects;

—Highroad surfaces, bridges, tunnels and component parts of the artificial structure that have been built with cement;

—Large and medium hydraulic engineering and the related major building;

—The chimneys over 50 meters, water towers over 30 meters and silos over 20 meters.

When selecting cement for other commercial concrete, cement prefabrications, engineering, transportation and hydraulic projects, the relevant technical and industrial standards should be met.

The documents encourage the development of the production lines that daily produces more than 2000 tons. In enterprises where conditions are mature, new dry production line shall be built. The policy aim s at promoting cement industry reconstructing and product quality improvement.

3) Close Small Vertical Kiln

According to the *Notice issued by the State Council's General Office on Transfer the State Economic and Trade Commission's Opinions on Checking up and Reorganizing Small Glasswork Factories* and *Small Cement Factories* and *the First Catalogue on Rejecting out-of-date Production Capacity, Processes and Products,* small and medium scale cement factories using vertical kiln shall be gradually disused before 2006. Most vertical kiln cement producers in Tieshan district shall be disused.

4) Environment protection policies

Currently, China's environment policies have been materialized by 8 environment management systems, including Environment Impact Assessment System for Constructional Projects; Three Qualifications System for Constructional Projects; Payment for Pollution Discharge System; Quantitative Evaluation System for Integrated Treatment of Urban Environment; Accountability System for Environment Protection Targets; System for Pollution Reporting and Registration and Pollution Discharge License; System for Centralized Pollution Control; and System for Time-limited Pollutant Treatment and Treatment of Hazardous Waste by Administrative Bodies.

As to the implementation of these systems, the following systems are closely related to enterprises: Environment Impact Assessment System for Constructional Projects; Three Qualifications System for Constructional Projects; Payment for Pollution Discharge System; System for Pollution Reporting and Registration and Pollution Discharge License and System for Time-limited Pollutant Treatment and Treatment of Hazardous Waste by Administrative Bodies.

On July 1, 2003, the *Managing Rules on Levying and Using Pollutant Discharge Fees* was issued by State Environment Protection Administration. According to it, the fee

levying ways and scope has been adjusted: the former fee charging for pollution discharge that over a certain standard is changed to charge fee both for within-standard and over-standard pollution discharge.

Formerly, fee was charged on the basis of one single over-standard factor. Now, various pollutants are converted into an equivalent pollutant and fee shall be charge according to the converted total pollution. The fee charged is included into government financial budget and managed as exclusive fund for environment protection. The expenses incurred by environment administrations are covered by government finance. In this way, the pollution discharge fee levying become or fair and reasonable.

Considering the reality that the number of cement producers is large and there is difficulty to conduct on-line monitoring, the data got from monitoring shall be integrated with materials measurement. Different amount of pollutant discharge fees shall be worked out according to different production processes. According to the new fee charge standard, the previously uniform charging standard shall be changed from 0.91Yuan per ton to 0.6 Yuan per ton (vertical kiln) and 0.25 Yuan per ton of cement for new dry process production lines. The new charging standard shall greatly motivate enterprises to adopt and apply new technologies to productions

In China, the most widely adopted practice is to issue permit for water waste. This practice has not been adopted in Hubei and the currently practice in Hubei is pollution discharge reporting and registration. An enterprise makes an application and the local Environment Protection Bureau examines and approves the application, conducts monitoring, approves pollutant discharge and issues pollution discharge license. There is also another way to obtain certificate of registration. The enterprise negotiates with local Environment Protection Bureau and if gets approval, those enterprises that sign Voluntary Agreement with government can directly get license.

Environmental impact assessment and "Three Qualifications" policy has to be conducted when newly building, expanding or rebuilding cement projects in Tieshan district. However, there is hardly any regulation to punish the behaviors that run counter to what is required in Environment Impact Assessment system. There is also no corresponding judicial review stipulation. The results of environmental impact assessment can only be guaranteed by the "Three Qualifications" system because the administrative scope of China's environment administrations have been quite limited. Therefore, in order to ensure the role of "Three Qualifications" system and environmental impact assessment, it is essential to coordinate different departments engaged in planning, economy, project administration, project implementation, project assessment and environment administration for them to undertake their own obligations and duties. LPIC in Tieshan district of Hubei Province can be the right body to undertake such role of coordination.

6. Market Status

1) Large Market Demand and Steadily Sales Growth

The output in 2003 has increased notably. From January to July, the total amount of cement produced by factories above certain scale has reached 17.09 million tons, the highest level among corresponding periods of previous years, 16.3% higher than the same term in last year. The increase range of cement output in Wuhan and Huangshi is higher than the average level in Hubei province. The sales value of the cement industry in Hubei province has reached 4 billion Yuan, 16% increase compared with the same term last year. Sales and Production rate is 97%, the highest level among corresponding periods in recent years.

2) Factors affecting cement market in Tieshan district

Although there is large market demand for cement this year, all the cement producers in Tieshan district depend on vertical kiln for production. 5 dry processes rotary kiln cement production lines shall be successively established in the neighboring regions, the technical advantages of these new production lines seriously threatens the market share enjoyed by Tieshan district's 5 cement producers that use vertical kiln production line. This will force the pilot enterprise to raise fund and conduct technical upgrading.

According to the results of the analysis of the national cement production, the national cement output in 2002 was 725 million tons, ranking first in the whole world. The demand for cement was 700 million tons. The demand and supply was roughly balanced. Stimulated by the market signal, some enterprises have recently invested in cement production and led to over-investment. It is quite possible that the government shall adopt some measures to restrict cement production.

3) Conflict between cement industry and resources has intensified

The prospected limestone reserves in Huangshi city are about 220 million tons and the un-prospected reserves are quite limited. In order to protect the limestone resources, it has been publicly proclaimed by the government to prohibit the exploitation of limestone. Therefore, the production of those enterprises that have no self-provided mine shall be restricted. So the pilot enterprises are advantaged to develop cement industry. In Tieshan district, there is no linking-together land that is over about 30 hectares, which is required for enterprise establishment. The milestone resources have been distributed to the present enterprises.

7. Financing Status of the Pilot Enterprise

The pilot enterprise, Lufeng Cement Company of Lufeng Group, Huangshi city,

Hubei Province is the largest producer in Tieshan district and its output accounts for 51.2% of the total output of the local industry. It is a major part in the development of local cement industry.

Since 2001, Lufeng cement company has invested13.80 million Yuan in technical upgrading, including12.80 million Yuan from its' own finance, 1 million Yuan from social sources. About 180 million Yuan shall be needed for technical upgrading in second-phase project and the entire fund shall be used for newly building dry process rotary kiln cement production lines. The enterprise is expected to collect 50 million Yuan; bank loan 60 million Yuan and there is still a 70 million Yuan financial gap. Financing difficulty is the major obstacle to enterprises' adopting energy efficiency technologies.

With China's financial system reform, the public-owned banks have been reformed into commercial banks. In the process of applying for bank loan, the key problem the enterprises faced with is the provision of mortgage such as land, workshop building and equipment. If enterprises fail to get bank loan, they will have not enough fund to conduct complete technical upgrading. In 1996, People's Bank of China adopted the policy of loan trace out all life. This policy has made local banks would rather turn over the savings than run the risk of granting loans to enterprises. Enterprises that enjoy good financial status and credibility, like the pilot enterprise, can only get loan of not more than 60 million Yuan. Other enterprise in Tieshan has even greater difficulties in collection fund for technical upgrading.

8. Technological Status

Table 4: Statistics on Staff Structure in Cement Industry

Enterprise name	Total number of staff Employed	High professional title	Medium professional title	Preliminary professional title	Junior or senior high school
Lufeng Cement factory	652	6	10	10	599
Sanbing	380	2	6	8	346
Erbing	252	1	4	4	233
Xinfeng Cement factory	120	0	2	4	106
Total	1404	9	22	26	1289
Percentage of the total	100	0.7	1.6	1.9	91.5

Cement industry in Tieshan district has easy access to technical information because

of the following reasons: The directors of the four cement factories in Tieshan district have long engaged in the line and they frequently visit advanced cement factories both in home and broad and study their experiences; all the chief engineers of the four cement factories have been qualified university graduates and are capable of studying and taking up new knowledge; Tieshan district is closely associated with Wuhan Science and Industry University. The university has silicate major and provides direct technical guidance for local cements industry; all the production lines of the four cement factories have been designed by qualified designing institute.

In spite of that, cement industry in Tieshan district also looks forward to supports provided by professionals and institutes from home and abroad.

9. Recommendations

1) Build New Dry Process Rotary Kiln that Daily Output is More Than 2000 Tons in the Pilot Enterprise.

With mature conditions, part of the present equipment shall be rebuilt to new Chalmette milling stations and other vertical kilns in Tieshan district shall be closed.

2) Help Enterprises to Finance

Lack of fund is major obstacle to the development of cement industry in Tieshan district. The fund needed shall be raised by GEF project, local government and Lufeng Cement Company itself.

After signing the Voluntary agreement, PIC and PMO grant certifies of "Demonstration for UNDP/GEF Energy Conservation & GHG Emission Reduction in Chinese TVEs Project". This will help the pilot enterprise use influence of GEF project and try to win financial support from governments at various levels and financial institutes.

PTPMC (Beijing Hong Yuan Environment Protection Science and Technology Co. Ltd.) should enter the project as soon as possible in order to guarantee the progress and feasibility of the technical upgrading plan and to promote the financial institutes to invest in the pilot enterprise.

3) Publicize Energy Efficiency Voluntary agreement and extend it to all the cement enterprises in Huangshi city.

Annex: Schedule for Study Tour of Cement Industry in Tieshan District, Huangshi City, Hubei Province (Sep 16-20, 2003)

Time	Subject	Activity	Locale	Participants
Sep 16	Working meeting in Tieshan district	Confirm study tour itinerary and other affairs	Hotel	PMO, members of subcontractor expert group, local policy experts and industrial professionals
Sep 17	Workshop with cement producers of Tieshan District	1. Property right status of the enterprises and their performances; 2. The willingness and obstacles to enterprises' adopting energy efficiency technologies; 3. The implementation of the policies on tax reimbursement, environment protection and energy efficiency and obstacles to the implementation willingness; 4. Specific suggestions and expectations for administrative departments	Hotel	PMO, PIC, CTA, members of subcontractor expert group, local policy experts and industrial professionals and directors from Tieshan cement factories.
Sep 18	Workshop with LPLC members	1. Discuss LPIC constitution; 2. Implementation of the national and local energy efficiency policies; 3. Measures, planning and ideas on energy efficiency among local industries, especially among cement industry; 4. the willingness of the involved stakeholders to participate in project implementation and support they possibly provide for the project.	Hotel	PMO, PIC, CTA, subcontractor expert group, LPIC representatives from local Planning and Statistics Bureau, Economic Development Bureau, Science and Technology Bureau, Finance Bureau, Bureau of Agriculture, Forestry and Water Affairs, Office under Tieshan Subsidiary Bank of Agriculture and local policy experts.

To be continued

Continue

Schedule for Study Tour of Cement Industry in Tieshan District, Huangshi City, Hubei Province (Sep 16-20, 2003)

Time	Subject	Activity	Locale	Participants
Sep 19 AM	Discussion on Voluntary Agreement	1. Visit the pilot enterprise 2. Confirm the framework of energy efficiency technology upgrading 3. Discuss the items of Voluntary Agreement	Pilot enterprise	PMO, PIC, CTA, subcontractor expert group, LPIC representatives and local policy experts
Sep 19 PM		Discuss the items of Voluntary Agreement	Hotel	
Sep 20	Visit local Environment Protection Bureau, Science and Technology Bureau and Office under Tieshan Branch Bank of Agriculture	Continue policy research and collect local laws and policies	Environment Protection Bureau, Science and Technology Bureau and Office under Tieshan Subsidiary Bank of Agriculture	PMO, subcontractor expert group and local policy experts

Annex11.6.3:

Energy Efficiency Voluntary Agreement

BETWEEN

Government of Tieshan District, Huangshi City, Hubei Province
(Hereinafter referred to the Government)

AND

Lufeng Cement Company Ltd, Tieshan District, Huangshi City, Hubei Province
(Hereinafter referred to the Demonstration Enterprise)

1. Background

Energy Efficiency Voluntary Agreement is an agreement that is entered voluntarily by and between a trade organization or individual enterprise and the government in order to improve energy efficiency and reduce greenhouse gas emissions. Industry organizations or enterprises commit to meet the target of energy efficiency or GHG emission reduction, and the government provides preferential policies and/or other incentives to the industry organizations and the enterprises.

In order to formulate and implement action plans to promote regulatory reforms and commercialization of energy efficiency technologies and projects among TVEs, the Energy Conservation Voluntary Agreement is formulated so as to improve energy efficiency and reduce greenhouse gas emissions.

2. Targets of Energy Conservation

2.1 Through the Voluntary Agreement implement, the Government shall fulfill the transformation of governmental function and explore a new mechanism aimed to achieve the same energy conservation goal but without compulsory commands. Furthermore, the Demonstration Enterprise shall reduce production cost, improve product quality, protect environment, and thus, establish a better public image for the enterprise.

2.2 The Demonstration Enterprise establishes voluntarily the following direct Energy Efficiency targets: based on 2002 (reference year), by 31st December 2005, the Demonstration Enterprise shall complete the Energy Conservation Project and achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 21%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 24%.

Indirect Energy conservation: through improving product quality, saving raw material, reducing the proportion of cement in concrete, prolonging product life, energy can be indirectly conserved

2.3 If the government adopts stricter environmental standard and more energy is consumed, the targets can be adjusted.

3. Measures for Energy Conservation

3.1 In order to fulfill the target of Energy Conservation on time, the Demonstration Enterprise shall establish a concrete Energy Conservation Plan, which shall be reviewed and approved by the Government, and implement the plan carefully.

3.2 The Demonstration Enterprise shall enhance the energy management, establish energy management system and energy efficiency standards, improve the internal regulations, assign full-time energy manager to be responsible for the energy management, improve employee's consciousness of energy conservation

4. Preferential Policies

4.1. The Government shall take the Demonstration Enterprise as a key supporting enterprise. The support includes imbursement on scientific research, technological innovation, and environmental protection, and implementation of the national policy on tax reduction or exemption related to utilization of wastes such as waste residue and other national or local encouragement policies and measures for energy conservation and environmental protection. Depreciation acceleration can be applied to the equipment in the Clean Production List. Energy audit and training expense for the Energy Conservation Project can be included in the management cost. The proportional limit of cost of R&D on energy conservation can be increased and included in the management cost.

4.2. The Government committed to assist the Demonstration Enterprise in solving some financing problems such as financing difficulties through the governmental credit system for medium- and small-scale enterprises and to recommend the Demonstration Enterprise to apply for recycling fund loan and other commercial loans, which will be used in the energy conservation project.

4.3. After the Demonstration Enterprise signs the Voluntary Agreement, the Government shall promise to recommend for the pilot program as well as award the honorable title to the Demonstration while introducing and extending the experience of the Demonstration Enterprise in the pilot on media.

5. Monitoring and Assessment

5.1 The Government shall submit an Annual Report on implementation of the Voluntary Agreement to the PIC in the first quarter of the year and receive the instruction from the PIC.

5.2The Demonstration Enterprise agrees to receive assessment of the effect of the Voluntary Agreement implementation by a Technical Team established by an independent third party.

5.3 In the valid period of the agreement, the Demonstration Enterprise shall submit an Annual Supervision Report to the Government and the Technical Team in written form in the first quarter every year, and submit the Final Report in the first quarter in the next year after the Agreement ends. The report shall include: production statistics, energy consumption data, status of implementation of Energy Conservation Plan and Energy Conservation Project, effect of energy conservation, problems and barriers, plan for the next year, measure adjustment, experiences and lessons, and suggestion for perfecting the Voluntary Agreement.

5.4 The Technical Team is responsible for evaluation in the implementation of the agreement, including the evaluation of the Energy Conservation Plan, Annual Monitoring Reports, and the Final Report submitted by the Demonstration Enterprise. The Technical Team shall inform the assessment result in written form to the Government and the Demonstration Enterprise. The assessment report shall cover evaluated comments on the authenticity of data, the Energy Conservation Plan and projects of the Demonstration Enterprise, the status to meet the targets, and the suggestion on Agreement modification.

5.5 If the Evaluation Report indicates that the Demonstration Enterprise failed to meet the requirement that the Agreement defines, the Demonstration Enterprise shall adopt measures including identifying problems, seeking new energy conservation measures, improving the energy conservation efforts in the next year, modifying energy conservation plan, based on the advice from the Technical Team.

6. Modifications and Termination

The agreement shall be modified or terminated if the following conditions occur:

- ✧ The Laws, Regulations, or policies related to energy or environmental protection have big changes compared with the year when the agreement is signed.
- ✧ Implementation of the Agreement has negative impact to the development or normal operation of the Demonstration Enterprise.

The agreement shall come into force from the date it is signed and be invalid on 31st Dec, 2008. Any pending matters in the agreement shall be discussed jointly between parties and an additional agreement shall be entered and being equally valid.

Government of Tieshan District, Huangshi City, Hubei Province (seal)	Lufeng Cement Company Ltd, Tieshan District, Huangshi City, Hubei Province (seal)
Authorized representative	Authorized representative
Date:	Date:

Appendix: Assessment of Energy Conservation Potential

The demonstration company is a medium-scale township enterprise. It owns the limestone mines and clay mines, and clag is from local copper mines and Wuhan Steel Company. The company has four $\phi 3 \times 11M$ standing-kiln cement product lines. The annual production is 500,000 tons of P.O 32.5, P.O 42.5, P.S 32.5 cement.

Energy Consumption in 2002

Type	Quantity	Coefficient	In tce	CO_2 /t
Coal	72,311t	0.7143	51,652	128,768
Electricity	33,320,000kWh	0.383×10^{-3}	12,762	31,815
Total			64,414	160,583
Cement Production			440,300 t	
Clinker Production			308,210 t	
Clinker Energy Consumption			168 kgce/t	
Total Electricity Consumption of Cement			76 kWh/t	
Total Energy Consumption of Cement			146 kgce/t	

Planned Energy Conservation Projects

Measures	Expected Energy Conservation	Time
Adopt rotate kiln to replace shaft kiln, the grade and heat endurance is improved.	Clinker energy consumption: 121kgce/t, Total Electricity Consumption of Cement: 80kWh/t, Total Energy Consumption of Cement: 117kgce/t	2004/1-2004/12

Indirect Energy Conservation Effect:

Indirect Energy Conservation	Expected Energy Conservation	CO_2 Emission
Improve the quality of product, and prolong the life of cement by 10%	Based on the production in 2002, energy of 5,679 tce can be conserved per year.	14,158t/y。
Reduce the proportion of cement in concrete, reduce the area of concrete section by 30%.	Based on the production in 2002, energy of 17,037 tce can be conserved per year.	42,473t/y。
Increase the amount of additives through improving the cement quality。		

Annex 11.7:

Training materials

11.7.1 Minutes of Training Workshop on Establishment and Capacity Building of Local Policy Implementation Committees (LPICs)

11.7.2 Teaching materials

11.7.2.1 Energy Conservation –One of the Important Strategies on Solving Energy & Environmental Problems in China (Cao Fengzhong)

11.7.2.2 Energy Conservation and Management in Industrial Enterprises (Meng Zhaoli)

11.7.2.3 Project Progress Report-Phase II (Tang Min)

11.7.2.4 Designing Results and Attendant Points of LPIC Action Plans (Zhou Hong)

11.7.2.5 Contract Energy Management Mechanism II (Zeng Wu)

Annex 11.7.1:

Minutes of Training Workshop on Establishment and Capacity Building of Local Policy Implementation Committees (LPICs)

Date: September 23-25, 2004

Venue: Beijing Fragrant Hill Hotel

Subjects: Energy Conservation and Management in Industrial Enterprises, Program Finalization of Technical Innovation, Energy Conservation –One of the Important Strategies on Solving Energy & Environmental Problems in China; Recurrent Economies; Energy Management Contract; Project Implementation Status; Designing Results and Attendant Points of LPIC Action Plans; Experience Exchange on VA Implementation in China.

Pattern: Lectures of National Experts & Discussions

Participants: GEF-China Secretariat; Department of S & T, Education & Rural Environment, MOA; MOA Township Enterprise Development Center (TEDC); Experts from China Energy Conservation Association, Tsinghua University, and Environmental & Economic Policy Research Center in State Environmental Protection Administration, China.

A. Background

According to the contract, holding the training workshop on establishment

and capacity building of LPICs is an important task to subcontractors in Phase II .It aims at summarizing outputs of Phase I , functioning on all cylinders of the four newly established LPICs, disseminating the best practices, and doing the replication of VA system more efficiently.

B. Content

The three-day training workshop was chaired by Mr. Wang Xiwu, senior administrator of PIC Secretariat. It went as follows: training sessions on the first two days, and discussions on the last day.

The first day:

The training session started with the introduction of participants by Mr. Wang Xiwu. Mr. Cao Fengzhong, professor from Environmental & Economic Policy Research Center in State Environmental Protection Administration, China, gave a lecture on *Energy Conservation –One of the Important Strategies on Solving Energy & Environmental Problems in China.* Professor Meng Zhaoli from Tsinghua University gave a lecture on *Energy Conservation and Management in Industrial Enterprises.*

The second day:

Mr. Hu Bo from China Energy Conservation Investment Corporation (CECIC) gave a lecture on *Energy Management Contract.* Training expert Tang Min briefed the project implementation of Phase II . Counselor Zhou Hong briefed the designing results and attendant points of LPIC Action Plans.

The last day:

The established LPIC representatives reported the activities carried out and capacity building of pilot TVEs. Participants discussed the establishment of another four LPICs. Mr. Wang Xiwu disposed of tasks on next step and summed up the three-day training workshop.

C. Results

1、Seeing eye to eye with trainees and knowing the current environmental and

energy saving circumstances. (Either local government officials or TVE managers consider the current situation as hot spot. Instead of working reluctantly, they are willing to make achievements in the good environment created by the project. All the participants promise to work closely with PMO and assist PMO with the project implementation, especially the dissemination of the established LPIC Action Plans and the establishment of another four LPICs.)

2、Clarifying the project implementation strategy and approach, and letting local government officials and TVE managers in another four pilot counties, especially the representatives from replication counties, know the objectives, significance, framework and procedures of establishment and capacity building of LPICs.

3、Exchanging experience in LPIC establishment & capacity building and project implementation of pilot TVEs, so as to provide experience for reference.

4、Enriching participants' knowledge on environmental and energy saving policies and recurrent economies, and knowing new financing channels such as the energy management contract.

5、Clarifying tasks and requirements in different counties and TVEs.

Annex: Name List of Trainees

Annex:

Name List of Trainees

Name	Gender	Title	Unit
Gao Shangbin	Male	PMO Permanent Deputy Director, Project Coordinator	Department of S & T, Education & Rural Environment, MOA
Wang Xiwu	Male	Senior Administrator	PIC Secretariat
Wang Guiling	Female	Deputy Director	PMO
Wen Gang	Male	Doctor	GEF-China Secretariat
Wang Hai	Male	General Manager	Beijing Hongyuan Company
Xiong Wei	Male	Assistant Manager	Beijing Hongyuan Company
Zheng Ge	Male	Project Assistant	PMO
Song Dongfeng	Male	Contract Officer	Beijing Hongyuan Company
Fan Liping	Female	Assistant	PIC Secretariat
Shao Chen	Female	Assistant	Beijing Hongyuan Company
Cao Fengzhong	Male	Researcher & Professor	Policy Research Center, State Environmental Protection Administration
Hu Bo	Male	Expert	China Energy Conservation Investment Corporation (CECIC)

Meng Zhaoli	Male	Professor, EE Voluntary Agreement Expert	Tsinghua University
Tian Yishui	Male	EE Expert	Agricultural Engineering Research and Designing Institute, MOA
Tang Min	Female	Training Expert	TEDC
Zhou Hong	Female	Counselor	TEDC
Yuan Hui	Male	Director General	Dalian Township Enterprise Bureau

Name	Gender	Title	Unit
Yu Deyan	Male	Factory Director	Jinmei Foundry, Dalian
Zou Xinglong	Male	Assistant of the General Manager	Lufeng Cement Company, Hubei
Li Longbao	Male	Director General	Jiangning SME Bureau, Nanjing
Liang Xinbao	Male	Factory Director	Moling Foundry, Nanjing
Wang Lizhi	Male	Director General	Xinjin Township Enterprise Bureau, Sichuan
Gong Muquan	Male	General Manager	Yongxing Brick Plant, Sichuan
Shen Xinglong	Male	Division Chief	Science & Technology Division, Zhejiang Township Enterprise Bureau
Shen Fuqiang	Male	Assistant Manager	Shenhe Cement Company, Zhejiang
Li Li	Male	Secretary General	Guangdong Cement Association
Liu Guansheng	Male	Board Chairman & Manager	Baojiang Cement Company, Guangdong
Zhou Quan	Male	Deputy Secretary General	Xi'an Roof & Wall Materials Guild

Wang Yuman	Male	Director General	Baqiao Township Enterprise Bureau, Xi'an
Ling Fuhe	Male	Factory Director	Liucun Brick Plant, Xi'an
Feng Junliang	Male	Factory Director	Gangyuan Coke Company, Taiyuan
Zhao Zhijie	Male	Director General	Shanxi SME Bureau
Gao Zhicheng	Male	Board Chairman	Xinggao Coke Company, Shanxi
Hou Kang	Male	Assistant Manager	Xinggao Coke Company, Shanxi
Zhang Shaoxian	Male	Deputy Director	Liaoning Renovation Office of Roof & Wall Materials
Ma Jiangang	Male	Director	Xianyang Renovation Office of Roof & Wall Materials, Shaanxi
Jin Rongsheng	Male	Deputy Director	Management Office of Metallurgy & Automobile Industry, Ningbo
Hu Changguo	Male	Manager	Cixi Huili Machinery & Electronics Co.

annex 11.7.2.1

Energy conservation: an important strategy to ensure China's energy and environment security

Cao Fengzhong

Policy Research Center
for Environment and Economy,
State Environmental Protection Administration

Energy is crucial to national economic development. The United States has waged war for energy, China has been seeking energy security cut-in and Russia has depended on its energy advantage and conducted energy diplomacy.

China is short of energy and about 50% relies on import. To enhance China's energy security, first a secure channel for energy import must be sought; second, energy conservation must be practiced as a major strategic measure.

1.Brief introduction of China's energy development

1.1 China's energy development status

Since late 2002, China's energy supply-demand pattern has changed dramatically and the phenomenon of supply falling short of demand has reappeared due to many factors. First, the over-development of energy-intensive industries such as steel, cement and electrolytic aluminum have contributed to national economic growth, but the power consumed by these industries has accounted for about 30% of the national total while the new industries that meet industrialization requirement have been under-financed. Second, civil energy consumption pattern has been upgraded.

Coal is the most important energy source in China. In 2003, coal accounted for 69% of the total consumed energy. The mining, processing and burning of coal has caused serious air and water pollution. In a word, China's total energy reserves are huge while the reserves per capita is very low. There are only a small number of rich ores. For most other ores, the prospecting, mining and utilization has been quite inadequate.

Energy efficiency in China is very low. Energy consumption per unit output value is 3 to 4 times higher than that of the developed countries, the unit energy intensiveness level of China's major industrial products is normally 40% higher than that of the industrially developed countries. With technical innovation and upgrading, energy conservation can be practiced in China. Currently, energy conservation has been included in national economic and social development plan and specific energy conservation administration is to be established.

1.2 Traditional energy consumption trend in major countries and regions

According to the analysis results of *International Energy Prospect* edited by the information agency of the US Department of Energy, in 1990, the US consumed 24% of the global energy, EU countries 17%, former Soviet union countries 17%, China 8% and Japan 5%. The 2001 statistics shows that US consumed 24% of the global total, EU countries 17%, former Soviet union countries decreased to 10%, China increased to 10% and Japan leveled off at 4%.

In the future, according to the forecast of International Energy Agency, by 2010, the US shall consume 24% of the global energy, EU countries 15%, former Soviet union countries shall drop to less than 10%, China shall rise to more than 11% and Japan shall remain its 5% share.

By 2025, the US shall consume 22% of the global total, EU countries 13%, former Soviet union countries less than 10%, China shall increase to more than 14% and Japan shall drop to 4%.

According to International Energy Agency's forecast, the energy consumption growth rate of the developed countries and regions such as EU and Japan shall gradually slow down. From 2001 to 2025, the *total energy consumption growth rate* for EU, Japan, the US and the former Soviet union countries shall be 0.7%, 0.8%, 1.4% and 1.5% respectively. For the rapidly-growing countries such as China, the growth *rate shall reach* 3.5%, higher than the global average.

Some major countries' energy consumption and its global share ***(Unit: Quadrillion Btu)***

Countries and regions	1990		2001		2010		2025	
	Amount	Share	Amount	Share	Amount	Share	Amount	Share
The US	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
EU countries	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
former Soviet union countries	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
China	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Japan	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
World total	[illegible]	100.0	[illegible]	100.0	[illegible]	100.0	[illegible]	100.0

Source: the information agency of the U.S Department of Energy, 2004

According to some research results, the full-scale construction of a better-off society by 2020 shall require the energy consumption growth rate reach 3%-4.5%. The energy demand scenarios are as flows:

After 2020, the energy demand is between 2.4(low scenario) and 3.1 (high scenario) billion tons coal equivalent:

2.4 billion tons coal equivalent scenario requires to practice energy conservation, optimize energy structure and implement environment protection policies;

3.1 *billion* tons coal equivalent scenario also needs enforced sustainable development policies. If the external environment is unfavorable and the policies inadequate, problems shall arise.

Upgraded energy demand: coal consumption shall drop from the current 67% to 55%—65%, and natural gas shall rise from 2% to 8%—10%. Oil consumption shall rise slightly and power shall rise to 14%.

It is predicted that in 2020, China's annual coal *output capacity shall be increased by 1.1 billion* tons, oil by 20 million tons, natural gas by 90 billion cubic meters and oil refining capacity by 200 million tons.

In 2020, energy supply and economic development *shall be restricted by* human, resource, environment and national strength. In order to ensure energy security, a sound development strategy shall be formulated as soon as possible.

2. Energy conservation is a strategic measure to ensure China's energy security

The tenth Five-year development plan specifies policies and measures to promote energy development. First, quicken reform paces and establish energy industry management system that matches the social market economy rules. Second, adjust energy financing policy, establish energy structure adjustment fund and promote energy restructuring. Third, establish macro monitoring network, with financial and legal measures as the major method and supplemented with necessary administrative measures. Forth, formulate policies and measures to promote energy development *in central and western China in order to guarantee the realization* of Western Development strategy. Fifth, support the development and construction of oil gas bases abroad. Sixth, carry out Energy Conservation Law and improve energy efficiency.

3. Energy conservation is an inevitable choice for China's economic development

In 2003, China became the second largest energy import country. It is estimated that about 40% oil has been consumed by more than 20 million automobiles, among which 25%,or 6 million are private cars. Suppose every two people own a car, there will be 700 million cars in China. Suppose every car consumes 0.5 ton oil every year, the total oil for cars will reach 350 million tons, equivalent to the total amount that US has imported from the world. So even suppose the fuel efficiency is increased one times or two times, and every 10 people own a car (the world average level), it is impossible for the world to export enough oil for our needs.

4. Energy conservation can bring economic benefits as well as environment benefits

There is a great potential for energy conservation in China because of two reasons: firstly, Chinese products are energy intensive. Currently, the unit energy intensiveness level of Chinese energy intensive products is normally 40% higher than that of the developed countries. The unit energy intensiveness level of some major products made by domestic manufacturers is 4 times higher than that of other advanced manufacturers. According to the results of the energy conservation analysis made in 35 industries, with upgraded technologies, China's energy conservation potentials can reach 100 million tons of cte in the near future. Secondly, in terms of the output value, the energy intensiveness level is also high. According to some calculation results, with industrial restructuring and product structure readjusting, decreasing the proportion of energy intensiveness industries, increasing the proportion of high value-added industries and promoting the civil use of high-quality energies, the energy conservation potentials can reach 300 million tons of cte in the near future.

The shortage of energy has forced the enterprises to adopt energy efficient technologies. Since energy cost is a major part in the total industrial expenses, energy conservation has become an effective way to reduce industrial costs.

Enterprises have been forced to adopt energy conservation technologies because of the national shortage of energy. Since energy cost represents a major part of the total industrial cost, energy conservation has become an effective way to reduce industrial expenses.

It is calculated that energy and materials accounts for 75% of industrial products cost. Energy efficiency is only 32～34%, 10% higher than that of the advanced industrial countries. 1% drop can create 10 billion Yuan benefit. So China's energy conservation market is huge.

It is estimated that the total value of China's energy conservation technical service market can reach 300 billion Yuan. If all the commercially mature energy conservation measures can be fully adopted by relevant industries, the annual energy conservation value can reach 80 billion Yuan.

Shortage of energy and low competitiveness of the energy-intensive products has forced enterprises to adopt energy conservation technologies and increase economic benefits. Yongtai Paper Group Ltd has upgraded its processing with energy conservation technologies. Water consumption per ton of paper has been decreased from 100 tons to 60 tons, 10 Yuan waste water treatment cost per ton of product is saved in this way. With the adoption of frequency conversion technologies in pump and blower fan, about 15% power is saved. The improved drying equipment saves 100 tons of steam every day. With the adoption of these three technologies, about 4 million Yuan is save every year and the company's competitiveness is notably increased.

Actually, power conservation is not the only measure that brings about economic and environment benefits. The price of all the resources is decided by its scarcity and its supply and demand. Every effort made for energy conservation shall earn good economic income. If an enterprise fails to change its backward productive and energy utilization ways, what it has to handle is not only the simple question of energy conservation. Resource waste directly leads to increased production cost and consequently its loss of price competitiveness.

5. Energy conservation measures adopted in China

Administrative measures

Carry out the Energy Conservation Law and formulate implementing rules. Conduct industrial restructuring in an obligatory way and phase out the backward processes. Reform the non-private-owned vehicles, encourage private cars but increase parking fees and operation cost. Expand the use of obligatory energy conservation measures such as setting an air conditioning temperature limit for all the public agencies except for special cases, requiring all the electric appliance to be technically energy efficient and restricting fancy lighting projects.

Financial measures

Price can be used to adjust supply and demand relation. In a market economy, price is determined by market, but price is partly determined by tax rate and tax amount. Therefore, government can use subsidy and tax to influence price. Subsidy can be given to those manufacturers that use energy conservation equipment and progressive taxation be levied to those energy wasters. Preferential policies such as tax deduction can be granted to air conditioner manufacturers that design the lowest temperature limit as 26℃ (It is estimated that in Beijing and Shanghai, urban air conditioning load accounts for half of the total). Taxation measures such as value-added tax and consumption tax can be utilized.

6. Energy Conservation Voluntary Agreement is a major measure to conserve energy

6.1 The practice of Energy Conservation Voluntary Agreement in foreign countries

Energy Conservation Voluntary Agreement (ECVA) has been voluntarily signed by industrial organizations and companies in order to achieve certain environmental objective , to increase energy utilization efficiency and to reduce pollutant discharge. The long-term Voluntary Agreement (VA) aiming at reducing CO2 emission and increasing energy efficiency has been widely practiced in foreign countries and has been accepted by more and more people as a non-compulsory policy instrument.

VA is signed to promote energy efficiency. Currently, in the US and some EU countries, ECVA is usually included in GHG emission reduction VA. The agreement contents vary in different countries or different situations. However, it generally includes two points: the industry or an individual company ' s promise to realize some energy efficiency objective within certain time; some government incentives.

Since the adoption of the United Nations Framework Convention on Climate Change, VA aiming at reducing GHG emission and increasing energy efficiency has been widely adopted by developed countries such as Denmark, France, Germany, Sweden, Holland, the US and Canada. By now, there are 300 Voluntary Agreements in EU, 30000 local environment control agreements in Japan and 40 Voluntary Agreements at the federal level.

6.2 Voluntary Agreement classification

According to the degree of stakeholders' participation and agreement contents, OECD has classified VA into two types. There is also some kind of combination of these two types.

The first type of Voluntary Agreement is reached after the negotiation of industrial entities and government agencies. The two parties negotiate all the items or parameters in order to fulfill a certain objective. If no agreement is reached, the government probably adopts other policy measures.

The second type is voluntarily participated by the public. The VA formulator usually works out a series of requirements that the enterprises should completely meet. The enterprises shall decide whether he shall participate in it or not. The typical public Voluntary Participation Agreement is known as menu VA, that is the government puts forward a pre-formulated policy menu for the enterprises to choose.

There is a kind of unilateral Agreement which is formulated by the industrial entities, without any participation from the public administrations.

6.3 State Voluntary Agreement cases

Holland

In 1992, in order to increase energy efficiency without issuing new laws, the Netherlands signed Long-Term Agreement (LTA) with industrial enterprises. LTA is the major policy instrument used to increase energy efficiency. LTA is a formal contract guided by the civil law. According to the State Environment Policy Plan, the Netherlands government aims to increase energy efficiency by 2% every year. According to LTA signed with industrial entities, the aim is to increase energy efficiency by 20% during 1989 to 2000. In 1996, LTA covered 26 industries and more than 100 enterprises, representing 90% of Dutch industrial energy consumption. LTA sets quantitative energy conservation goals for the industrial entities. It has also formulated long-term plan for the enterprises to reached overall energy conservation objectives.

Sweden

The testing of Sweden's energy plan is quite flexible and the only requirement is to participate in the measures that has been taken or shall be taken. The goal of the VA formulated in 1994 is to increase energy efficiency and reduce CO2 emission.

Most of the 24 participants are manufacturers including some big companies. The agreement is non-compulsory and no negotiation or sanction is involved. The only consequence that the company fails to comply with the plan is reduced credibility and reputation. The participants need to submit independent energy audit and promise to take certain measures to improve energy efficiency.

The Swedish Energy Association (STEM) collects the industrial materials, compares the enterprises' production, energy consumption, raw materials input and other data with international management standards such as ISO14000 and feedback whether the actual situations conform to the standards. STEM also provides reference data to the participants. The reference data are not necessary conditions but sometime the enterprises voluntarily apply them in their reports. STEM encourages the participants to publish their objectives and progress reports.

6.4 Energy Conservation Voluntary Agreement is important to China's energy and environment security

Firstly, ECVA shall promote China's energy efficiency and its energy and environment security. For the past 20 years, China's primary energy output has grown at the rate of 4-5% every year, which has supported the annual 8-9% growth of the national economy and realized the macro-objective of providing economic development with energy half by exploiting and another half by saving. This does not mean that the energy problem has been solved. On the contrary, low energy efficiency has become a serious problem.

Currently, China energy consumption per 104 RMB Yuan GDP is two times higher than the world average. The energy consumption of each unit of major energy-intensive products is 40% higher than the internationally advanced level and serious pollution is caused. In China, industrial enterprises consumes 2/3 energy of the national total and 3/4 power. Therefore, to promote energy conservation and pollution reduction in industrial enterprises has become urgent and important. Like any other policy and measure, ECVA is not a cure-all, but it shall promote enterprises' energy conservation and pollution reduction.

Secondly, ECVA shall contribute to the implementation of the Energy Conservation Law and Cleaner Production Promotion Law. According to Cleaner Production Promotion Law, after an enterprise attains a national or local discharge threshold standard, the enterprise may enter into a voluntary agreement or agreements for further resource conservation and pollution discharge reduction with the relevant local administrative departments responsible for economics and trade, and the relevant administrative department responsible for environmental protection. The relevant local administrative departments for economics and trade, and the relevant administrative departments for environmental protection shall publicize the name of the enterprise and the results of its resource conservation and pollution control and prevention in the primary local media.

In order to carry out this stipulation specified by the Cleaner Production Promotion Law, some relevant agencies have been researching and formulating policies to promote the adoption of ECVA in China.

ECVA is important to social market economy restructure and administrative system reform. VA shall be an effective measure for enterprises to voluntarily practice energy conservation and pollution reduction. The adoption of VA can also reduce administrative costs, increase the publicity and transparence of government law enforcement, which is significant to energy and environment protection.

ECVA shall contribute to the establishment of modern enterprise system and increase China' s industrial capability. With fierce market competition and increased energy and environment protection pressure, it is urgent for government to provide guidance in terms of technical processing, management and information and promote enterprises to reduce cost and expand market share, which is crucial to industrial sustainability. ECVA shall also promote enterprises to upgrade its technical and management ability and improve its overall competitiveness.

Recently, I have participated in GEF steel industry energy conservation project. China' s steel industry energy conservation has achieved great results. MOA has done some work for the adoption of ECVA. I had participated in the meeting held in Xi' an. A lot of specific and practical experiences have been accumulated and can be gradually extended to other energy intensive industries.

As to the sustainability of the ECVA, more complementary policies and measures should be researched, such as information disclosure, favorable policies such as financial and tax policies, industrial entities are to be encouraged to set higher energy conservation goals. According to the relevant stipulations of the Energy Conservation Law and Cleaner Production Promotion Law, an ECVA implementing methods shall be formulated in order to guide and supervise the implementation of the agreement.

In the long run, the role that ECVA shall play in energy and environment policy system shall be researched and VA shall complement other policies and a characteristic energy and environment policy system shall be formed.

Annex 11.7.2.2

Industrial enterprise energy conservation and management (outline)

Tsinghua University Meng Zhaoli Sep. 22, 2004

Ⅰ.Teaching materials for the presentation

《Energy conservation and sustainable development》

1. China's energy situations

(1) Characteristics of the energy system

①Total reserves is huge but reserves per capita is short

② Coal is the predominant energy source and considerable transportation involved

③Low energy efficiency and heavy pollutions means heavy task for energy conservation

④Rapid economic development requires more energy

⑤High-level oil import dependence means great risks

(2) Energy conservation

①Energy conservation is important to ensure economy double two times with doubled energy input.

②Energy conservation can relieve energy risks and guarantee national energy security.

③Energy conservation and environment protection can ensure economic sustainability

④ Energy conservation can increase industrial competitiveness and improve people's living standards.

⑤ It is proposed to list energy and resource conservation as a basic national policy in order to promote human, resource and environment work.

2. China's Energy conservation

(1) Energy conservation achievements

①Industrial restructuring has achieved notable energy conservation results

- The vigorous development of the tertiary industry
- The closing-up of the *Five-Small* industrial enterprises

②Technical progress contributes to energy conservation

③Strengthens macro management

- Energy conservation laws, regulations and standards
- The practice of energy conservation certification system
- The extension of typical experiences
- Strengthen public awareness, education and training

④Deepens reform and promote energy conservation

- Open up energy price and practice price hearing
- Strengthen energy conservation, reduces cost and improve industrial competitiveness

⑤Actively practice cleaner production and implements Cleaner Production Promotion Law

(2) Major problems

①Inadequate awareness of the significance and urgency of energy conservation

②Incomplete complementing laws and regulations, poor monitoring system and lack of supervision and management

③Inadequate energy conservation incentive policies that suit to market economic mechanism rules

④Under-finance for energy conservation and backward productive

processing, technology and equipment

(3) Strengthen energy conservation management

①Strengthen government energy conservation management

- Highlight the leading role that government should play in energy conservation management
- Reinforce energy conservation administration, increase its authorized size and win more public fund support
- Government management focus: formulate policies, laws and regulations and strengthen macro monitoring and supervision
- Strengthen the demonstration role of government efforts
- Principles by which energy conservation should abide: regulated by laws, oriented by policies, guided by plans, innovated mechanism, promoted by demonstration, information services, public awareness campaign and training, international cooperation, financial support. In this way, an energy conservation management system and mechanism shall be established

② Energy conservation laws, regulations and standards formulation

③ Highlight end equipment's energy conservation

④ Energy conservation focuses:

- Industrial energy conservation(steel, chemical industry, building materials and power generation……)
- Building energy conservation
- Transportation energy conservation

⑤Establish intermediary organizations and practice commercialized operation

- The extension of *Contract Energy Management Method*
- Practice public bidding for government purchase or other purchase of large amount of energy conservation products

- The extension of new processing, new technologies, new products and new equipment and strengthen industrial energy conservation technical upgrading

⑥Adopt Energy Efficiency Voluntary Agreements

⑦Practice demand side management (DSM) and promote power conservation

⑧Establish energy conservation incentive system

- Restrict resource over-consumption and formulate energy conservation tax system
- Deepen energy price reform and establish energy price forecast system
- Establish energy conservation public support system and set energy conservation fund
- Formulate preferential policies for establishing energy conservation funding and loaning system
- Establish heavy tax and phase-out system for energy-intensive and heavy pollution products

⑨Conduct international cooperation and exchanges

⑩Strengthen energy conservation public awareness campaign and training

Annex II.7.2.3

"Establishment and Capacity Building of LPIC" - PHASE II

Progress report

Tang Min
Center for Township Enterprise Development, Ministry of Agriculture

September 23 2004

I. Completed and ongoing work

- **1. Collected information and got ready for project implementation.**
- **Time:** June 1 to 15
- **Objectives:** collect policies, laws, regulations, standards and other relevant materials.
- **Locus:** State library, Ministry of Agriculture, National Development and Reform Commission, Building Materials Bureau, Land Management Bureau, Wall Materials Reform Office, Environment and Resources Committee of the National People's Congress, China Environment Protection Association and Building Materials Association.

I. Completed and ongoing work

- **2. Drafted and revised project implementation plan**
- **Time:** June 5 to 10
- **Form:** Small-scale workshop
- **Contents:** Specify project task division, get prepared for project implementation and discuss each task's objective and the way to fulfill it.

2

I. Completed and ongoing work

- **3. Drafted and revised project proposal and submit it to UNIDO**
- **Time:** August 1 to 15
- **Contents:** Illustrate our understanding of project objectives and major tasks, specify project term, project area and the industries related, illustrate the differences between phase I and phase II, subcontracts and bring forward questions that shall be noted during project implementation.

3

I. Completed and ongoing work

- **4. Conducted field survey**
- **Objectives:**
  - Identify the technical barriers against the adoption of high-efficient energy conservation technologies in brick TVEs in Baqiao district or even in Xi'an city and in coking industry in Qingxu County or even in Shanxi province. Learn the demand that possible extension demonstration TVEs have for the project and the possible services it might provide. Collect industrial information for formulating extension demonstration TVEs construction plan.

4

4.Conduct field survey

- **4.1 Survey in Baqiao district, Shaanxi province**
- **Time:** June 14 to 16
- **4.2 Survey in Qingxu county, Shanxi province**
- **Time:** August 18 to 21
- **4.3 Drafted related materials**
- Survey report, LPI constitution draft, action plan draft, energy efficiency voluntary agreement draft.

5

I. Completed and ongoing work

- **5. Organize expert workshop**
  - Discuss project implementation plan, project proposal training plan, major training contents, how to implement the project in a better way, survey plan and the next working plan.

6

I. Completed and ongoing work

- 6. Formulate training plan, prepare training materials and get ready for the training.
  - Formulate training plan
  - Prepare training materials

II. Next work plan

- **1. Continue to conduct field survey.**
- **2. Promote government to sign Energy Efficiency Voluntary Agreement with extension enterprises**

8

II. Next work plan

- 3. Evaluate the results of the implementation of Action Plans and Energy Efficiency Voluntary Agreements by the four LPICs in Phase I.
- 4. Summarize the experiences accumulated from the phase I LPICs and revise Action Plans and Energy Efficiency Voluntary Agreements.
- 5. Revise the Assessment Systems for Action Plan and Energy Efficiency Voluntary Agreement.

9

III. Problems needed to be noted

- 1. According to the experiences accumulated in Phase I and the fact of increasingly deepened government reform, the supporting administrations for the construction of LPIC in phase II shall be decided according to the local realities.

10

III. Problems needed to be noted

- 2. As government administration style changes from micro to macro affairs and from commanding to serving, industrial associations shall play an increasingly important role. It is proposed to absorb the associations into LPIC.

11

III. Problems needed to be noted

- 3. The technical and equipment compositions of some TVEs have changed drastically. The average scale of the enterprises has become bigger, the equipment level has been enhanced and the number of TVEs has become smaller. The project should consider enhancing the demonstration TVEs' technical and equipment level so that more enterprises can be covered by the project.

III. Problems needed to be noted

- 4. The Action Plans formulated should fit into local government's long, medium and short-term working plans and strategies. LPIC shall be helped to formulate feasible and practical Action Plans.

13

III. Problems needed to be noted

- 5. Strengthen project information exchanges and communication, share project resources and build capacity to handle out-bursting events.

14

Thanks!

annex 11.7.2.4

UNDP/GEF Energy Conservation & GHG Emissions Reduction in Chinese TVES – Phase II

LPIC Action plan design achievements and problems needed to be noted

September 2004, Beijing

1

Abstract

- Action Plan design background
- Action Plan design achievements
- Problems needed to be noted in action plan design

2

1.Action plan design background

1.Working basis

2. Working procedure

3. Working emphasis

3

1.Action plan design background

1-1 Working basis

- Basis

-PIC overall arrangement

-Terms of Reference requirements

-LPIC characteristics

-Local social and economic development plan

-Demonstration TVEs conditions

4

1.Action plan design background

1-1 Working basis

Output:

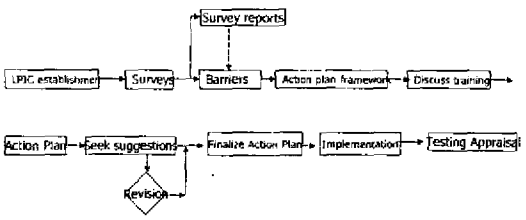
-Survey reports

-Action Plans

5

1.Action plan design background

1-2 Working procedures



6

1.Action plan design background

1-3 Working emphasis

- LPIC Establishment
- Surveys
- Action Plan design and implementation
- Testing appraisal

7

2. Action Plan design achievements

1. Materialize LPIC from a concept to realization
2. LPIC model has been revised and improved in practice
3. LPIC system is being formed

8

2-1 Materialize LPIC from a concept to realization

- The necessity of LPIC has been proved by practice
- Materialize LPIC from a concept to realization

-Establish LPIC

-Formulate constitution framework

-Formulate action plan sample

-Formulate assessment system plan

9

2-2 LPIC model has been revised and improved in practice

- Reasons for revision
- Revision model

10

2-2 LPIC model has been revised and improved in practice

- Reasons for revision

-Government administrations reform

-Government function changes

-Industrial policy changes

11

2-2 LPIC model has been revised and improved in practice

- Revision model

-Establish LPIC at provincial, city and county levels

-LPIC standing body is transferred from TVE administrations to industrial administrations and associations

12

2-3 LPIC system is being formed

- Establish working mechanism
- Specify working model
- Established LPIC at provincial, city and county level

13

3. Problems needed to be noted

1. Conduct deep survey with diversified forms
2. Market oriented
3. Good interaction with local government
4. Stress local characteristics
5. Pay attention to the role of associations and industrial administrations
6. Consult foreign relevant industrial development history
7. Refer to the achievements of other project subcontractors

14

3. Problems needed to be noted

3-1 Conduct deep survey with diversified forms

- workshop
- interview
- Questionnaire
- others

15

3. Problems needed to be noted

3-2 Market oriented

- Fully reflect the principle of voluntariness
- Change the way of thinking

16

3. Problems needed to be noted

3-3 Good interaction with local government

- Consult local government economic and development plan
- Consult local government work plan

17

3. Problems needed to be noted

3-4 Stress local characteristics

18

3. Problems needed to be noted

- 3-5 Pay attention to the role of associations and industrial administrations

19

3. Problems needed to be noted

3-6 Consult foreign relevant industrial development history

20

3. Problems needed to be noted

3-7 Refer to the achievements of other project subcontractors

21

New Model for Financing of Energy Conservation Upgrading

中节蓝天投资咨询管理有限公司 CECIC Blue-Sky

Contract Energy Management Mechanism

Annex 11.7.2.5 | Sept 2004

CECIC Blue-Sky

中节蓝天投资咨询管理有限公司

- Contract Energy Management Mechanism
- Energy Conservation Service Company
- Project Implementation and Profit-making Mechanism
- Project Line
- China Energy Conservation Promotion Project
- Guarantee Mechanism
- Technical Support

2005-08-04 2

CECIC Blue-Sky

中节蓝天投资咨询管理有限公司

1.Contract Energy Management Mechanism

- A way to pay the total cost for energy conservation project by energy cost saved;
- By using future benefits resulted in energy conservation project, end-user upgrade its production process and equipment to cut current operation cost.
- Energy management contract is signed by and between the company where energy conservation project is implemented (end-user) and the professional service company seeking profits.
- The company where energy conservation project is implemented is conventionally supposed to take both risks and profits from the project. Under the new mechanism, end-user is usually not required to make large investment in the project.

2005-08-04 3

CECIC Blue-Sky

中节蓝天投资咨询管理有限公司

2.Energy Conservation Service Company （ESCO）

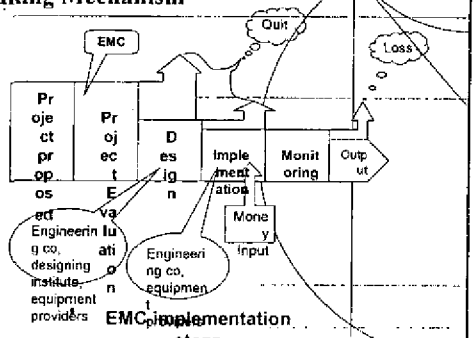
ESCO is professional, profit-seeking company operated under contract energy management mechanism. ESCO signed service contract with end-user keen in technical upgrading for energy conservation, and ESCO's responsibilities include making investment or looking for investors in such project, and providing services such as energy efficiency auditing, project design, implementation, monitoring and management. The service company will share the benefits resulted in the project for further development.

2005-08-04 4

CECIC Blue-Sky

中节蓝天投资咨询管理有限公司

3.Project Implementation & Profit-making Mechanism



EMC implementation steps

2005-08-04 5

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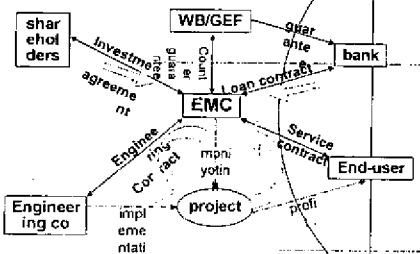
3.Project Implementation & Profit-making Mechanism



EMC financing structure

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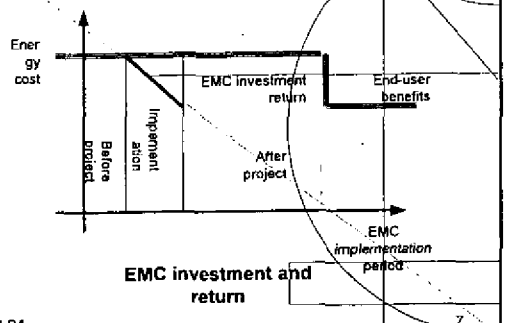
3. Project Implementation & Profit making Mechanism



EMC investment and return

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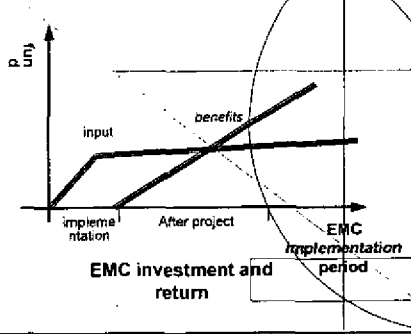
3. Project Implementation & Profit making Mechanism



EMC investment and return

CECIC Blue-Sky

4. Project Line

- Mechanical punch-type grinding machine
  - Media free and dry grinding. Materials are crushed into powder by high-speed crashing of materials. It is good for cement & ceramic production, replacing ball grinding machine. It saves electricity and steel ball.
- Electricity saving by motor-speed regulating
  - Regulating through high-voltage frequency
  - Regulating by wave-cutting and inner feeding
- High-voltage dynamic Work-free Compensation
  - Aimed to solve system problems such as fast change of work-free power in speed, voltage fluctuation and flash, and imbalance of three phases. It applies to power supply system of ark furnace, rolling mill and elevator.

CECIC Blue-Sky

5. China Energy Conservation Promotion Project

- This is a large project starting co-sponsored by SETC, WB & GEF. It was launched in 1998, and aimed to promote transition of energy conservation mechanism in China, to cultivate new mechanism and to push forward industrialization of energy conservation in China.
- The main task is to support professional energy conservation management and service companies (EMC), based on ESCO mechanism in developed countries.
- In Phase I, three pilot EMCs have been established in Beijing, Shandong and Liaoning.
- In Phase II, the aim is to replicate and industrialize EMC throughout the country for sustainable development of EMC

CECIC Blue-Sky

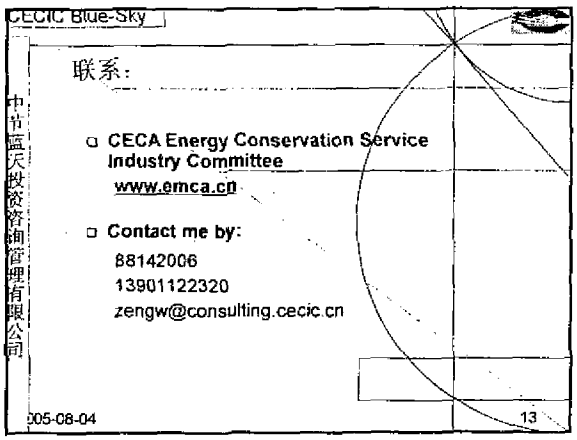
6. Guarantee mechanism

- China Economic & Technical Investment Gurantee Co Ltd provides guarantee service to ESC investing in energy conservation project.
- Guarantee for
  - EMC as the priority
  - Others including
    - EMC clients (where project is implemented)
    - Companies carrying out energy conservation project based on contract energy management mechanism
- Standards of energy conservation project
  - Energy conservation profit accounts for 50% of total project profit
  - Project is based on contract energy management mechanism.

CECIC Blue-Sky

7. Technical Support

- CECA Energy Conservation Service Industry Committee
  - The implementing agency for WB/GEF China Energy Conservation Promotion Project Phase II—EMC Sub-project
  - Founded in April 2004
- Providing technical support in capacity building of new energy service companies
  - Training
  - Technical assistance


CECIC Blue-Sky
中节蓝天投资咨询管理有限公司
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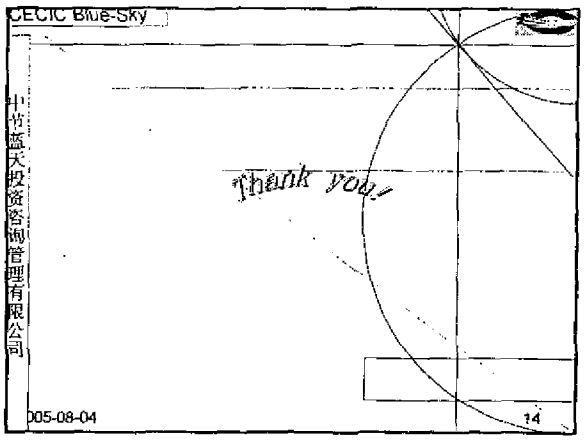
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中节蓝天投资咨询管理有限公司
Thank you!
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Annex11.8:

LPIC achievements and experiences

The project *Energy Conservation & GHG Emissions Reduction in Chinese TVES – Phase II*, which has been jointly funded by UNDP, UNIDO and GEF, aims to remove the market, policy, technical and financial obstacles to the adoption of GHG emission reduction technologies, which have been identified in brick, cement, casting and coking TVEs. National PIC has been established to remove these obstacles. According to PIC's requirements, four LPICs have been established in Phase I in Xinjin county of Sichuan province, Lushun county of Liaoning province, Tieshan district, Huangshi city of Hubei province, Jiangning district, Nanjing city of Jiangsu province. 4 more LPICs have been established in Phase II in Tongxiang city of Zhejiang province, Yingde city of Guangdong province, Baqiao district, Xi'an city of Shaanxi province and Shanxi province. A lot of work has been done in the above-mentioned 8 demonstration areas.

According to subcontract TOR, the 4 LPICs established in Phase I should be assessed and the Action Plans and Assessment Systems be revised. Based on the subcontractor's good performance in Phase I, the Phase II subcontract has been directly granted to the subcontractor, which contributes a lot to the smooth process of Phase II work. The work done in Phase II is also included in this report for summery and assessment.

Ⅰ. Brief introduction of phase Ⅰ and phase Ⅱ projects

During the implementation of Phase I and Phase II subcontract, with the help of PMO, the subcontractor has conducted a lot of work in the 8 demonstration areas as follows:

1. A lot of background materials and information has been collected by consulting and visiting government agencies, officials and experts.

2. Communicated with local governments and TVEs and helped them to understand the project's objectives, significance, contents, procedures, working methods and outputs.

3. Formulated survey schedule, survey outline and formats and handed them out to local governments and TVES for preparation.

4. Conducted field visits

(1) Discussed with potential LPIC members and industrial experts on the preparation work for LPIC establishment, its nature, vision, organization, responsibility and working procedure. Assisted local governments to establish LPIC and confirmed it by

issuing formal government documents.

(2) Conducted workshops and discussed with TVEs' managers, LPIC members and industrial experts on TVEs' willingness to adopt energy efficiency technologies, the existing policy barriers, TVEs' ideas on the current policies, their suggestions for better administrative management. Surveys were conducted to identify problems existed in the implementation of energy conservation and environment policies, policy barriers were summarized and the ways to remove these barriers were discussed with TVEs' managers and LPIC members.

(3) Visited local government agencies, collected first-hand materials on local government policies and discussed with government officials on the ways to remove the barriers. On the basis of this, Survey Reports and Action Plans were formulated.

(4) Visited demonstration TVEs' production lines and discussed with technical professional on technical reform plan and confirmed Energy Efficiency Voluntary Agreements.

5. Contacted LPIC members and TVEs by different means such as phone calls, workshops and field visits to keep track of their work developments.

Up to now, the work conducted in the 8 demonstration areas can be summarized in the following table. LPICs establishment and LPIC constitution in these areas have been formally confirmed by local government documents. Barriers against TVEs' adopting energy efficiency technologies have been identified and Action Plans have been formulated accordingly. TVEs had signed Energy Efficiency Voluntary Agreements with local governments.

Summary of Progress Reports of the 8 Demonstration Areas

	Setup of LPIC						Progress in the Demonstration Enterprises			
	Demonstration Areas	Establishment Date	Member	Survey Report	Action Plan	Monitoring and Evaluation Report	Demonstration Enterprise	Energy Efficiency Plan	VA Signing	CO_2 Emission shall be Reduction(t)
Phase I	Xinjin County of Sichuan	March 25,2002	Government Office, Information Office, Bureau of Medium & Small Enterprises, Bureau of Environment Protection, Administration of Land & Resources, Bureau of Construction & Planning	Finished	Finished	Finished	Yongxing Shale Brick Factory of Xinjin County	Finished	Finished	3,679.95

	Dalian of Liaoning	Sep 8,2003	TVEs Bureau, Bureau of Science & Technology, Bureau of Environment Protection, Finance Office	Finished	Finished	Finished	**Jinmei Pipe Casting Ltd of Lvshun**	Finished	Finished	350.00
	Tieshan district of Huanhshi of Hubei	Sep 10,2003	Government Office, Bureau of Planning, Statistics and Pricing, Bureau of Economic Development, Bureau of Science & Technology, Bureau of Environment Protection, Bureau of Finance, Bureau of Agriculture, Forestry and Water Resources, Agriculture and Industry Relation Office, Luzhangshan Street Committee, Agriculture Bank of Tieshan Branch	Finished	Finished	Finished	**Lufeng Cement Ltd.**	Finished	Finished	23,364.00

	Jiangning district of Nanjing of Jiangsu	Aug 22,2002	Government Office, Bureau of Finance, Bureau of Science & Technology, Bureau of Environment Protection, Agricultural Bank, Planning and Economic Development, Government of Moling Township, Moling Casting Factory (Headquarter)	Finished	Finished	Finished	**Moling Casting Factory**	Finished	Finished	4,156.00
Phase II	**Tongxiang of Zhejiang**	Oct 8, 2004	Bureau of Finance and Local Taxation, Bureau of Science & Technology, Bureau of Environment Protection, Bureau of National Taxation, People's Bank of Tongxiang Branch, Heshan Township Government, Shenhe Cement Ltd	Finished	Finished	Unfinished	**Shenhe Cement Ltd**	Finished	Finished	21,136.00

	Yingde City of Guangdong	Jan 13, 2005	Government Office, Bureau of Economy & Trade, Bureau of Science & Technology, Bureau of Environment Protection, Agriculture Bank of Yingde Branch	Finished	Finished	Unfinished	**Baojiang Cement Material Ltd**	Finished	Finished	15,477.00
	Baqiao District of Xi'an of Shaanxi	June 14, 2004	Government Office Bureau of Economy & Trade, Bureau of Science & Technology, Bureau of Environment Protection of Baqiao Brach, Bureau of Construction, Administration of Land and Resources, Construction Material Quality Testing Station, Agriculture Bank of Baqiao Branch	Finished	Finished	Unfinished	**Liucun Brick Factory**	Finished	Finished	1,622.01
	Shanxi Province	Feb. 28, 2005	Shanxi Bureau of SME, Shanxi Economic Committee, Shanxi Bureau of Science and Technology, Shanxi Commission of	Finished	Finished	Unfinished	**Gangyuan Coking Company of Taiyuan**	Finished	Finished	107,676.00

			Finance				Xinggao Coking Company of Shanxu	Finished	Finished	

Ⅱ. Achievements in phase Ⅰ and phase Ⅱ

From June 2003 when the first LPIC was established in Xinjin county of Sichuan province to January 2005 when the last LPIC was established in Yingde county of Guangdong province, 19 months have passed and 8 LPICs have been established. They have conducted a lot of activities according to their Action Plans and notable results have been achieved.

The subcontractor has encouraged LPICs to conduct work according to local realities, government policies, industrial features and characteristics. The work done by the LPICs is summarized as follows:

1. LPICs have promoted demonstration TVEs' energy conservation and GHG emission reduction

LPICs have provided policy and financial support to hasten the process of demonstration TVEs' energy conservation and GHG emission reduction. 9 demonstration TVEs in 8 regions have signed Energy Efficiency Voluntary Agreements with local governments. About half TVEs shall finish the technical reform tasks and it is estimated that 177,460.96 tons of CO2 emission shall be reduced.

2. LPICs have helped to extended Energy Efficiency Voluntary Agreement and 97 TVEs have been recommended to PMO as extension TVE.

For example, in Xi'an city alone, 25 brick TVEs were organized by LPIC to participate in the surveys conducted by subcontractors and Hongyuan Company. These 25 TVEs have accounted for 25% of local brick TVEs, 50% of hollow brick TVEs. 10 TVEs were selected as extension enterprises. Most of the 60 brick TVEs, 20 cement TVEs, 10 coking TVEs and 7 casting TVEs that have been selected by PMO were recommended by LPICs.

3. LPICs have assisted TVEs to apply for preferential fund to conduct technical reform

For example, LPIC of Xinjin County, Sichuan province signed a 50 million Medium and Small Enterprise Loan agreement with Sichuan subsidiary of State Development Bank. LPIC recommended Yongxing Shale Brick Factory as demonstration enterprise to Chengdu Finance Bureau. LPIC's efforts helped to provide 500,000 Yuan financial support for demonstration enterprise's energy efficiency and GHG emission reduction technical reform.

For another example, LPIC of Jiangning district, Jiangsu province has applied to Nanjing city Science and Technology Bureau for 125,000 Yuan as technical reform fund. The district Science and Technology Bureau has matched 80,000 Yuan to help Nanjing Moling Casting Factory, one of the demonstration enterprises, to establish a 1000-ton lost -foam aluminum alloy casting line. This project shall increase the total qualified rate from the former 85% to 95%.

4. LPICs have promoted the implementation of the tax policies and industrial policies

On the PIC annual meeting and LPIC training workshop, which was held in April 2004, Tieshan district LPIC of Hubei province introduced local policy implementation status to the participants. According to Notice on Added-value Tax for Some Comprehensive Utilized Resources and Other Products, which has been issued by Ministry of Finance and State Tax Administration, "the added-value tax, which is levied on cement that in the process of production, not less than 30% gangue, stone coal, pulverized fuel ash and furnace cinder (not including water granulated slag in the furnace) and other waste residues is mixed into the raw materials, is reimbursed", local LPIC helped Lufeng Cement Ltd, one of the demonstration enterprises, got 7 million Yuan as reimbursed added-value tax in 2002 alone. The same policy had not been satisfactorily implemented in Tongxiang city of Zhejiang province. Less than 60% added-value tax has been exempted. The to-be-established Tongxiang LPIC has attached great importance to this fact and a report was submitted to local government. The local government has clearly clarified their attitude that they will strictly implement the policy in 2005.

5. LPICs have provided policy recommendations to governments agencies

in Shanxi province, for example, there used to be two different development ideas for coking industry. One supports coking production with large-scale mechanical coking ovens, which is integrated utilization oriented. The other one supports heat recovery technology, which is clean and environment friendly. In selecting demonstration technologies for phase II subcontract, LPIC consulted with PMO, PIC and CTA and agreed that the heat recovery technology would be adopted and demonstration enterprises would be selected on the basis of this technology. The decision was discussed and passed by the tripartite meeting. In the process of implementation, this new technology had inevitably met the problem of low market and policy recognition. With this technology being adopted, the emission of benzopyrene has almost been reduced to zero and the emission of CO2 and SO2 is notably lower than that from large-scale mechanical coking ovens. A standard on heat recovery oven's waste gas emission has been planned in Shanxi province. This standard is much more strict than that for large-scale mechanical coking ovens. LPIC of Shanxi province proposed to provincial government that different standards for different production processes are quite unfavorable to the extension of the heat recovery technology. The provincial government has attached great importance to the proposal.

6. NGOs have played an active role

The role of NGOs such as schools, industrial associations, research institutes and volunteers has been fully played in formulating LPIC Action Plans. The NGOs' advantages of information, publicity, technologies, human resources, working network and influences are important for energy conservation and GHG emission reduction.

The industrial associations have played an important role in LPIC establishment during phase II . The influential Guangdong Cement Association has about 300

members and it has not only recommended demonstration TVEs in Yingde County to PMO and PIC, but also introduced the project to TVEs and governments. It has also helped subcontractor to conduct surveys. It provides local industrial policies, technical information and development plan to the surveyors. It also communicates with LPIC members. For another example, Dalian LPIC has conducted surveys among casting TVEs and helped to establish Dalian Casting TVE branch Association. The branch association shall play an active role in promoting industrial development and achieve industrial self-discipline.

7. LPICs have cooperated with local governments

For example, cement industry of Yingde County in Guangdong province is a pillar industry. Local government had invited China Building Materials Industry Academy to formulated local Cement Industry Development Plan. LPIC organized order-placing meeting and invited cement TVEs and large and medium scaled coal supplier from Shanxi province, Henan province, Hunan province, Guizhou province and Shaoguan city of Guangdong province to participate in the meeting.

For another example, in 2004, LPIC of Jiangning district of Nanjing city organized local casting TVEs to go to Dalian, Jinan, Suzhou and Shanghai to visit the static pressure production line and how they have reformed the welfare enterprises. This activity helped local TVEs to conduct institutional reform and to introduce new technologies.

Ⅲ. Experiences accumulated in phase Ⅰ and phase Ⅱ

1. It is necessary to establish LPIC to remove barriers against improving TVEs' energy efficiency

After the surveys conducted in 8 TVEs in different provinces and counties, the major policy barriers have been identified:

For a long time, government energy conservation and environment policies have heavily focused on state-owned enterprises, with TVEs being neglected. A great many preferential policies have been granted to state-owned enterprises, while many restrictive policies have been implemented among TVEs. The policy differences have not only restricted TVs' participation in energy conservation and environment protection activities, but also caused the collision between government behavior and enterprises' interest.

The newly promulgated laws and regulations on energy conservation and environment protection are equally applicable to TVEs, but there is a long way to go for local government to improve its law enforcement capability. The incomplete method system and incentive measures for the extension of energy conservation technologies have been unfavorable to motivate TVEs to participate in energy conservation and environment protection activities.

Most TVEs' lower awareness of the importance of energy conservation and environment protection has also been a major obstacle to the enforcement of relevant laws and regulations. The lack of self-discipline mechanism among TVEs and the

prevalence of local protectionism has seriously reduced the effect of the laws and regulations.

Another major obstacle to TVEs' conducting GHG emission reduction activities is the shortage of staff that are familiar with energy conservation and environment protection. Many people have been used to traditional technologies and management methods and their reluctant response to new things have slowed down the management, technical reform and fund-raising activities for energy conservation and environment protection.

The property right reform in many TVEs has not Doneyet. The unclear relation between ownership and management and the too high asset-liability ratio has seriously affected the TVEs' ability to obtain advanced technologies, to absorb social capital and to get bank loan.

Since the end of 2003, the shortage of power, coal and oil in China has produced considerable impact on China's economy. The higher energy price means that energy accounts for a higher share in product cost. In Tongxiang city, Zhejiang province, for example, the coal price in December 2003 was 300 Yuan per ton, and it accounted for 30% of the cement chamotte cost. In July 2004, the coal price was 600 Yuan per ton, and the coal share increased to 52%. According to some official predictions, energy shortage in China shall not be relieved in the near future.

It is very hard for one single institution to solve the above-mentioned problems because of the complicated administration system in China. As a special coordination institute, LPIC consists of members from different administrations that have different functions. The operation of LPIC has created an effective mechanism for different administrations to play roles. The functions of different government administrations have been integrated, which helps to strengthen law enforcement force, to change the policy environment that does not fit into market mechanism and to promote local government to adopt energy conservation policies and measures. The incentive policies shall increase TVEs' self-discipline awareness, promote them to implement environment protection and energy conservation laws and regulations and technical standards, and realize the goal of GHG emission reduction. LPIC is constituted by technical professionals, government officials and financial staff. All these members have offered their advice on how to help TVEs improve their energy efficiency and on how to formulate Action Plan. LPIC has also contributed a lot to environment protection and energy conservation cause by signing Energy Efficiency Voluntary Agreements with TVEs.

2. Experiences accumulated from LPIC establishment

(1) Communicate widely with relevant stakeholders and helps local governments and TVEs to fully understand the project

In the process of project implementation, it is the first time for many government officials and entrepreneurs to come into contact with the concept of international project as well as LPIC and Voluntary Agreement. It proves to be the biggest obstacle to the smooth implementation of the project. PMO and PIC have actively publicized the concept of LPIC and Voluntary Agreement on many occasions such as PIC annual

meeting and other activities conducted by other subcontractors. They have also spent a lot of time and energy on communicating with demonstration TVEs and local governments. In order to guarantee the quality of LPIC construction, PMO and PIC officials have participated in the surveys conducted by LPIC subcontractors. As to the establishment of LPIC and the extension of Voluntary Agreement, the subcontractors have changed their attitude from that I'll help them to that local governments wants my help.

(2) Conduct surveys before establishing LPIC

Before organizing a LPIC, surveys should be conducted to find policy barriers. According to the survey results, a practical Action Plan is to be formulated to remove the policy barriers and to extend Energy Efficiency Voluntary Agreement among TVEs. The relevance, effectiveness and operability of the survey and research is the key to the success of LPIC. The first-hand materials gathered during the surveys are crucial to future work.

(3) Diversify the setup of LPICs

- With TVE concept changes and economic reform deepens, the LPICs' supporting agencies are diversified

With enterprises' ownership becoming increasingly clear, the concept of TVE has become diversified. TVE is closely related to rural communities, agriculture and farmers and it is a geographic term. The term of medium and small-sized enterprise stresses the enterprise scale. The term of nongovernmental enterprise refers to enterprises that are not proprietarily controlled by government and big collectives and it stresses the ownership of the enterprise.

Identifying LPIC's supporting institute depends on actual situations. The relevant institutes' capability and local government's willingness should be fully considered. The establishment of LPIC with local characteristics is helpful for TVEs' energy conservation and GHG emission reduction.

- Industrial policy restructuring and the application of new technologies and new equipments has helped to change the geographic concept of LPIC

Industrial policy restructuring and the application of new technologies and new equipments have exerted considerable impact on the leading industries in some regions. It has not only changed local leading industry's technical equipment structure but also brought new opportunities for its development and for energy conservation and pollution reduction. LPIC at county level is quite limited to play an effective role. LPIC at municipal level or even at provincial level shall be a more effective coordination mechanism. The vision of LPIC integrated into municipal and provincial industrial restructuring and economic development is a breakthrough and a new trial for the regional concept of LPIC. It helps to promote energy conservation and GHG emission reduction among municipal and provincial leading industries. LPIC at municipal and provincial level have been established in Shan'xi province and Dalian city.

- Industrial associations play an effective role as NGO to change LPIC's undiversified membership

With government administration style changes from micro level to macro level and from command-oriented to service-oriented, various kinds of industrial associations emerge as the times require. These associations have been engaged in enterprise management. At the same time, entrusted by the local governments, they have undertaken certain government functions. It has become feasible for associations to support the establishment of LPIC and for its capacity building. Therefore, PMO has planned to establish LPICs among extended TVEs on the basis of Guangdong Cement Association, Xi'an Wall Materials Industrial Association and Shenyang Wall Materials Reform Office.

(4) LPIC's work being integrated into local government's work is a major step to keep LPIC's sustainability and vitality

LPIC's nature, working contents and achievements is closely related to government function and working objective. LPIC's work of identifying barriers against adopting energy conservation and GHG emission reduction technologies, helping them to remove these barriers and promoting TVEs' to adopt Voluntary Agreement has added living force to local government work. LPIC's work being integrated into local government's work is a major step to keep LPIC's sustainability and vitality.

(5) LPICs' work has closely depended on NGOs

Since 1990s, Chinese government has established the reform objective of "small government and big society". On the one hand, government needs NGOs to exchange information with the public and to help to maintain market and social order, to reduce government administration costs and to improve the efficiency of public decision making. On the other hand, the unorganized individuals also need NGOs to safeguard their interests. LPIC can utilize its advantages in information, communication, publicity, technologies, human resources, working network and influence to provide powerful support for energy conservation and GHG emission reduction.

Ⅳ. Problems identified in phase Ⅰ and phase Ⅱ

1. The public supervision and TVEs' self-discipline should be strengthened

The advanced technologies and ideas adopted in developed countries for energy conservation, GHG emission reduction and environment protection should be learnt with more open attitude and public supervision and TVEs' self-discipline should be strengthened. Like tax, energy conservation and GHG emission reduction and environment protection should be accepted as a kind of reward to the society.

2. LPICs' work should be closely integrated into demonstration TVEs' and local governments' work

It has been proved that the energy conservation and GHG emission reduction technologies and the technical reform plan recommended by PMO must be part of demonstration TVEs' development plan. LPIC action plan must be integrated into

local government development plan. It is the only way to ensure the smooth implementation of demonstration TVEs' technical reform. The major reason why there are some LPICs and demonstration TVEs whose construction process has lagged behind is because of the changed technical reform policy and plan. Accordingly, our work has to be adjusted.

3. LPICs' working experiences should be summarized and refined

It has been proved that in China, it is impossible for one single administrative institute to solve the complicated problem of energy conservation and GHG emission reduction. It is feasible for a special coordination institute, like LPIC, which was constituted by some relevant government administrations, to play an important role to remove policy barriers and to extend Energy Efficiency Voluntary Agreement. LPIC's operation experiences shall be summarized and problems shall be identified. Recommendations should be submitted to local institutional reform administration for their reference.