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278 p.
tables
graphs

23092

UNIDO Contract No.: 03/037/ML

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

P.O. NO. :16000426

Final Report

to

The United Nations Industrial Development Organization (UNIDO)

For the Contract entitled

Establishment and Capacity Building of Local Policy Implementation Committees

For the project

Energy Conservation And Greenhouse Gas Emissions Reduction In Chinese Township And Village Enterprises

– **Phase II**

Prepared by

MOA Township Enterprise Development Center (TEDC)

In April 2004

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Content

This is the final report submitted to UNIDO HQs by MOA Township Enterprise Development Center (TEDC) and MOA Center for Energy & Environmental protection Center (CEEP) (hereinafter referred to as the subcontractors) for the establishment and capacity building of LPIC under the project entitled "Energy Conservation and Emissions Reduction in Chinese TVEs – Phase II".

The report reviewed tasks accomplished during Sept. 1, 2003 and March 10, 2004, focusing on the following activities.

1.0 Confirmation of LPICs

2.0 Collection and analysis of information

3.0 The 1st training workshop

4.0 Field surveys

5.0 Discussions and modifications

6.0 The 2nd training workshop

7.0 Facilitating signing of VA

8.0 Observations and Recommendations

9.0 Annexes

1.0 Confirmation of LPICs

After implementation of the above-mentioned subcontract was initiated on Sept. 1, 2003, the subcontractors together with PIC started frequent contacts and communications with the local governments of the four pilot counties. The LPICs' nature, constitution, function, working procedure, action plan as well as their office location were finalized one by one after field surveys were conducted, seminars organized, questionnaires distributed and visits paid to local government authorities concerned. The subcontractors coordinated and guided the four local governments in forming LPICs. By Oct. 2003 the four LPICs were established and

confirmed by official documents issued by the local governments.

2.0 Collection and analysis of information

During the first four weeks of the contract period, the subcontractors approached industry associations concerned and industry supporting organizations, and searched on Internet for information about the four pilot sites. Information collected covers culture, economy, geography, TVEs' bank credit, status and development trend of the industries concerned, and local and national policies of energy and environmental protection. Through discussions, an outline and the methodology were developed for field surveys, including estimated barriers for smooth implementation of the subcontract.

3.0 The 1st training workshop

The first training workshop took place in two phases.

Phase One (July. 27 to Aug. 1, 2003) was combined with field survey in Xinjin County, Sichuan Province. Representatives from the local government authorities and brick making TVEs, about 20 in total, were trained in the aspects of project implementation, VA as well as national and international policies of environmental protection. The training needs of the pilot sites were investigated and identified in the meantime. Based on the activities carried out during this period, the subcontractors made revisions of subcontract implementing plan and program, and paved practical ways for the following training in Beijing.

Phase Two took place from Aug 3 to Aug 9, 2003 with the guidance and participation of PMO and the project CTA. The main activities include:

- As proposed by PMO and CTA, representatives include not only local officers and TVE executives from the four pilot sites stipulated in the

subcontract but also those from the other five to be confirmed.

- The objective of the training workshop was to educate the representatives the purpose, significance and working procedures of the subcontract for the establishment and capacity building of LPICs, thus laying a sound foundation to implement the subcontract.
- The topics of the training cover the project background and its implementation progress, plan and approaches for implementing the subcontract, national and international energy policies, and VA application in the developed countries.

Participants including PMO and PIC staff, CTA and the subcontractors' experts had heated discussions about the project, and expressed their ideas concerning energy conservation and emissions reduction. Good ideas were proposed in this regard. After the training, the local governments and pilot TVEs at the first four counties confirmed as pilot had a better understanding of the project objectives, tasks and strategic plan while representatives from the additional four counties knew more about the project and had more confidence in participating in the project. This is helpful for the subcontractors to move on smoothly with its tasks.

4.0 Field surveys

Field surveys were carried out during different periods: from July 27 to Aug. 1, 2003, Sept. 3 to Sept. 8, 2003 (Feb. 16 to Feb. 20, 2004), Sept. 16 to 21, 2003, and Oct. 22 to Oct. 27, 2003. The industries surveyed include brick making industry in Xinjin, cement industry in Tieshan District, Huangshi City, metal-casting industries in Jiangning District, Nanjing City and in Dalian, and the team visited the pilot TVEs there. Ms Wang Guiling, deputy director of PMO, was involved in all the survey tours while Mr. Wang Xiwu, the senior administrator of PIC Secretariat, took

part in the survey activities in Dalian and CTA was invited to the activities in Xinjin and the 2nd survey in Dalian. The VA expert recruited from the Netherlands also participated in the field survey in Xinjin.

Field surveys were divided into two parts: those of the industries concerned and visits to the pilot TVEs. Through discussions with LPIC members and TVE executives, special visits to organizations concerned and questionnaire, the team had a better picture of these industries at the pilot sites and the ownership reform there. They knew more about the programs that the local governments have implemented in energy conservation and environmental protection, and their planning for the coming years. Barriers in applying energy efficient technologies were located and analyzed. All these provided basis for developing LPIC statute and action plan. Visits to the pilot TVEs provided opportunities for the team and the TVE executives to jointly assess the TVEs' potential of energy conservation, to talk about their attitude and ideas about technical upgrading aimed at energy efficiency, and to develop a plan and the target for this purpose. These constituted the major parts of the VA to be signed by and between the local government and the pilot TVE.

Special remarks: As PMO replaced the pilot TVE in Dalian, a team of 7 consisting the subcontractors' experts, CTA, staff of PMO, PIC and PTPMC as well as sectoral experts, made a special survey of the replacing TVE.

With all the information collected in Beijing and at the four pilot sites, the team has prepared independent survey reports, and the design of action plan and VA has been completed.

5.0 Discussions and modifications

With the specific situation of the four pilot sites in mind, the subcontractors' team assisted the four LPICs in framing their statutes and action plans, and they worked together with the pilot TVEs in framing VA on energy efficiency. 6 seminars were held among experts concerned for thorough discussions and analysis of the information gained from the surveys. The team talked with PMO, PIC and CTA about the drafts of these documents for their comments, based on which revisions and modifications were made again and again. The drafts had also been faxed to the four LPICs respectively for their examination before they were finalized. Repeated modifications have been made of all the three documents during the processes of framing, drafting and finalizing. See Annex 9.1 for explanations on the modifications, which are aimed at enabling better understanding of the case study of the four pilot sites.

A scheme was also developed for evaluating and monitoring the Action Plan and the VA on energy efficiency in the principle of being easy and simple to operate and being effective. See Annex 9.7 for details.

On January 8, 2004, the subcontractors received comments and recommendations from Mr. Kornelis Blok, executive director of Ecofys, his colleague Ms Dian Philipsen, and Ms Lynn Price, team leader of LBL, about the VA draft. After careful study and analysis, their ideas were incorporated into the draft with modifications made to meet with the actual situation of the local governments and TVEs. Further consultations were then made with the project CTA before the draft was finally formulated.

On March 19, the drafts of LPIC Statute, Action Plan, Energy Efficiency VA and questionnaire designed were faxed to the four LPICs at Sichuan, Dalian, Jiangsu and Hubei for the comments of the local governments, and they gave no objections.

On the morning of March 29, Mr. Gao Shangbin from MOA's Science & Technology Department, Ms Cai Li from MOA's TVE Bureau, PMO & PIC staff, CTA and the subcontractors held consultations at the MOA conference center with Mr. Kornelis Blok and Ms Lynn Price. Mr. Blok briefed the participants about latest development in energy and climate policies in Europe while Ms. Price introduced voluntary actions aimed at GHG emissions reduction in the US. They also answered questions raised by the Chinese participants.

On the afternoon the same day, the VA and energy experts of the subcontractors had special discussions with Ms. Wang Guiling, PMO deputy director, Mr. Zhang Zhihong, CTA, Ms. Lynn Price and Mr. Blok, going through clause by clause the VA draft for Nanjing case. The foreign experts asked some questions about the clauses and proposed their comments, which were accepted by the subcontractors.

On the evening of March 30, the VA and energy experts of the subcontractors, Ms. Wang Guiling, Mr. Zhang Zhihong, Hongyuan executives and the representatives from 7 pilot TVEs had a meeting for face-to-face discussions about technical upgrading programs. The TVEs promised to move on with the programs adopted at the meeting.

The comments of UNIDO on the draft of final report reached the subcontractors on March 30, who e-mailed back explaining some necessary modifications. At the same time, modifications were done according to UNIDO comments, and observations from PMO, PIC and CTA, before they finally approved the draft.

The modified drafts of Statute, Action Plan and energy efficiency VA were faxed or e-mailed between April 2 and April 9, to the four LPICs and pilot TVEs for their final comments. They also presented no further comments.

On April 14, the subcontractors' team, PMO and Hongyuan staff and CTA met with the Xinjin pilot TVE in Beijing for its technical upgrading program, and agreement was reached on relevant details.

The subcontractors approached several times, PMO, CTA and PIC to consult with them about the draft of our final report. Their comments have all been accepted.

6.0 The 2nd training workshop

The 2nd training workshop can be divided into two parts.

Part one focused on preparatory work. On February 24, Ms. Wang Guiling and Mr. Zhang Zhihong joined the subcontractors' team to discuss about detailed arrangements of the workshop, including the workshop topics, program, venue, participants and lecturers, and a draft program was formed. The draft was modified and finalized after further consultations with Ms. Wang, Mr. Zhang and Mr. Wang Xiwu on March 3.

From March 3rd to March 26th, the subcontractors worked hard in arranging for lecturers to take part in this workshop, collecting their presentations, translating those of foreign lecturers, and having all materials compiled and ready for trainees. (See Annex 9.0)

Part two is the workshop itself. The workshop took place from March 29th to March 31st, thanks to the guidance and participation of PMO and CTA.

- As suggested by PMO and CTA, the subcontractors invited not only LPIC and TVE representatives from the four pilot sites under the subcontract but also local government officials and TVE representatives from other five pilot sites.
- The workshop is aimed at reviewing LPIC Subcontract Phase I and enabling the LPICs to move on with replication of the best practices

and promotion of VA mechanism throughout the pilot counties.

- The workshop covered topics such as energy and environmental policies in developed countries, significance, approaches and experience of VA application in China, barriers to VA application in China, mechanism for sustainable development of LPICs, as well as technical upgrading scheme for pilot TVEs.
- Following the presentations, discussions were held among the participants, PMO and PIC staff, CTA and the subcontractors' team on issues related to energy conservation and emissions reduction. The representatives from the pilot sites have put forward many good ideas about project implementation. The local government officials at the four pilot sites under the LPIC Subcontract Phase I promised to move faster in confirming the drafted LPIC Statute, Action Plan and Energy Efficiency VA while the pilot TVEs agreed to make quicker decision on their technical upgrading programs. The establishment of LPIC and the TVE technical upgrading design at the additional pilot sites are under way. The participants from these places expressed their confidence in project implementation, and their determination to seize the opportunity for sustainable development.

  More importantly, all participants discussed on the afternoon of March 31st, about problems found in the process of LPIC Subcontract Phase I, and tips for the additional pilot sites to carry out Phase II. Ms. Wang Hui, the team leader of the subcontractors, gave a report reviewing the implementation of the subcontract. Mr. Tian Yishui briefed the participants about the VA design, and Ms. Zhou Hong, legal expert of the team elaborated on the designing approach of and the revisions made to action plans for the LPICs.

Mr. Wang Hai, managing director of Hongyuan Co, talked about the major LPIC-related events to take place in 2004 under the subcontract for sustainable operation of Hongyuan while Ms. Wang Guiling gave a presentation about the PMO's work plan for 2004 and the schedule for the establishment and capacity building of the additional LPICs. Mr. Yuan Hui, deputy director of Dalian TVE Bureau and the director of Dalian LPIC reviewed the establishment of Dalian LPIC, and explained about its action plan and its future work. Mr. Liang Xinbao from the pilot TVE of Moling Metal Casting Factory unveiled the factory's plan for technical upgrading and future development. Mr. Shen Fuqiang, standing vice president of Shenhe Cement Co Ltd also reported activities they have taken in capacity building, and talked about the development of the company. Other participants from the pilot sites were also active in the discussions. The workshop concluded with the summary by Mr. Wang Xiwu.

The participants have agreed on the following points.

(1) The participants affirmed and praised the subcontractor's job. They agreed that the project is characterized by LPIC, which is combined with VA mechanism to realize the sustainability of the project.

(2) PMO, PIC and CTA are satisfied with the training workshop including its organization, implementation and results. TVE representatives found it informative and helpful for them to learn more. They felt enlightened on their future work.

(3) TVE representatives realized that under the current situation in China, TVEs have to pay enough attention to environmental protection so as to achieve sustainable growth. The project has

given the TVEs a chance for development. They expressed their commitment to speeding up activities under the project.

(4) All participants found the current situation in China is good for project implementation. PMO and PIC called on all LPICs and TVEs to seize the opportunity and take active actions. The subcontractors and Hongyuan are requested to take faster steps to assist LPICs and TVEs in implementing LPIC Statutes, Action Plan and VA, and in finalizing technical upgrading program for full implementation of TVEs' capacity building. (See Annex 9.0)

7.0 Facilitating the signing of VA

On April 19, the subcontractors contacted, with the consent of PMO, CTA and PIC, LPICs and pilot TVEs at Xinjin, Dalian and Jangning for the signing of energy efficiency VA. The texts of the three documents were delivered by express mail to them, and the local governments and pilot TVEs have signed the documents, respectively. Photocopy of the signed documents have been submitted to PMO, CTA, PIC and Hongyuan Co. (See Annex 9.0 for the photocopy.)

8.0 Observations and recommendations

Over the past 8 months, the subcontractorss have accomplished all the tasks and activities as stipulated in the contract, focusing on the establishment and capacity building of LPICs at four pilot sites, and the formulation of their statutes and action plans as well as VA on energy efficiency. We reviewed our work and had the following observations and recommendations, which will hopefully benefit future subcontractors for the establishment and capacity building of the other LPICs.

8.1 More should be done to help local governments and enterprises in keeping up with latest concepts of environmental protection and energy efficiency and in improving their awareness in this regard. China is a developing country. Local governments in China are at an initial stage to learn about environmental protection, and energy efficiency VA, especially. VA is something completely new to the Chinese TVEs. It is necessary to intensify publicity of new concepts. Local governments should be encouraged to develop environmental protection economy, and enterprises to establish the strategy of "priority given to environmental protection in the process of development".

8.2 Taking into consideration of the Chinese characteristics, we should put the local governments into full play. One of the major functions of LPIC is to coordinate policy implementation and adjustment. In China, the government is responsible to make policies and oversees policy enforcement. Efforts should be made to arouse the interest of local governments so that the project activities can be included in the work program of local governments. It will help to form a from-top-to-bottom mechanism to enhance project implementation.

8.3 LPICs can be established in various forms. The arrangement and functions of local governments differ from each other. The actual capacity and the attitude of local TVE authority or its supporting agency should be taken into consideration in fixing the form and functions of LPIC. LPICs can take different forms and have their own characteristics provided that priority is given to energy conservation and emissions reduction.

8.4 LPICs should be viable and active. Their action plans should incorporate the current and long-term work plan and strategy of local governments so that they compliment each other and interact in a good manner.

9.0 Annexes

Annex 9.1.1

Explanation for modifications in LPIC statutes

After the second progress report, the subcontractors approached the project CTA, PIC and PMO and had several discussions on LPIC statutes, which were also sent to the four LPICs for their comments and recommendations. Based on comments collected, the statutes were revised. The following are explanations for revisions and modifications made. They are meant to help readers to know about the process the statutes were developed and the reasons for the modifications.

1. Adjustment is made to the structure of the statutes so that they are more logically organized. For instance, "Organization of LPIC" is moved before "Functions of LPIC".

2. Modifications are made in "Functions of LPIC" and "Governance and Working Procedures", adding regular information provided to TVEs about updated energy efficient technologies and policies and environment evaluation.

3. "Reporting system" is added to working procedures.

Annex 9.1.2

Explanations on the Supplementary Survey and Action Plan

After sending the second phase session project report to UNIDO, the deputy director of PMO, Ms Wang Guiling, together with UNIDO Chief Technical Advisor, Dr. Zhang Zhgihong, made constructive comments on the survey reports and the action plans as follows.

1. Orientation of the survey report

The survey should focus on the setup of LPIC in the county where pilot enterprises are located. It also should focus on remove the market, policy, technical and financial obstacles to the pilot industries' production, sales and application of energy efficiency technologies. The title of the survey report should emphasize the setup of county LPIC.

2. The constitution of LPIC and the relationship between LPIC members should be clarified.

3. As to the problem of property rights reform, how it is conducted, what the results are, what problems exist and the definitions of different mechanisms should be clarified.

4. The exact contents of the referred current policies should be specified.

5. Survey results on environmental protection policies should be specified and the following points should be mentioned separately.

-Overall environmental protection policies

-Measures taken by enterprises

-Whether the enterprises reach policy requirements

6. Action plan

According to UNIDO's suggestions on action plans in the drafted final report and the changed realities, the action plans have been revised as follows:

1. The follow-up and report of the action plan has been added as the fifth part.

In this part, it is specified that in implementing the action plan, LPIC has to submit annual working report to national PIC and MOA's GEF office for evaluation. In this way, the whole process is followed up and reported and the action plan can be revised accordingly.

2.The demonstration enterprises' energy efficiency index is revised in Sichan and Nanjing' action plans.

Since the implementation of the second phase project in July 2003, the research and survey work in Sichan and Nanjing was finished respectively in July and September. But the technical upgrading plans of the demonstration enterprises in these two provinces have been revised according to the latest policy and market orientation.

1) In Sichan province, Chengdu Construction Committee has issued Notice on Some Regulations on Reimbursement by Wall Materials Specific Fund. According to the notice, since March 1, 2004, all the wall materials used by bodies engaged in construction and building must be new materials that are on the national extension list and be certified by Chengdu's Wall Reform Office; for those construction projects that use solid clay bricks, a fund shall be levied on the wall materials; before hiding the walls, the bodies engaged in construction and building must inform the Wall Reform Office to come and check the use of new wall materials, if the wall is hidden without checking, then a fund shall be levied on the wall materials. The policy has been known as physical examination for construction projects' energy efficiency.

According to Chengdu city' s realities, Chengdu Construction Committee shall not compulsively extend dry wall in the near future. However, it has been specified that no

outer wall is allowed for tile facing, but outer wall can use thermal insulation materials. In order to adapt to these policies, the demonstration enterprise has revised its technical upgrading plan.

In the former technical upgrading plan, the solid shale brick production line is to be reformed. Rotating kiln and tunnel kiln shall be used to produce multi-hole bricks, hollow bricks and decorative bricks. In this way, the goal of improving product' s quality, energy efficiency and GHG emission reduction shall be realized.

In the new technical upgrading plan, some new points are included as follows: adopt high-speed pulverizer to reduce the material granularity to less than 1mm; build storeroom of 800 m^2, the raw material will be stored for more than 3 days before used; use high-pressure vacuum squeezer to improve the quality of blank; improve the equality of baking; improve the quality of brick and reduce energy consumption; adopt heat insulation measures and temperature control system to improve thermal efficiency; produce hollow brick with hole ratio from 45% to above 60%.

2) In Nanjing city, because of the intense internal and external market competition, Shanghai Diesel Engine Company, a major customer of the demonstration enterprise, has brought forward higher requirement for the demonstration enterprise's products, so that the company itself can improve the quality of its own products.

In addition, Jiangning Economic and Technical Development Zone of Nanjing City is a national level high-tech development zone. It passed ISO14001 Environment Management System Certification in June 200. It has become the largest-scaled one, with best community supporting facilities and quickest development speed. The leading industries in the Zone include electronics, light industry, machinery, automobile, laser-involved industry and some other high-tech-intensive industries. It has been reported that Ford Company shall settle in the Zone and establish its automobile-manufacturing base. All these shall notably expand the demonstration enterprise's market.

In order to adapt to the market demands, the demonstration enterprise has revised the technical upgrading plan. Formerly, cold-box processes shall be adopted and the second annealing furnace shall be reformed. In the new technical upgrading plan, a static-pressure automatic shaping production line with capacity of 20,000 ton/year shall be built.

According to the revisions of the technical upgrading plans, the energy conservation objectives in action plans have been accordingly revised. No revision has been made in the corresponding survey reports.

pment of new dry-processed cement should be supported. The cement projects with daily output of 4000tons should be supported in resourceful area and all the enterprises are encouraged to disuse the backwards technology and apply new dry-processed cement production technologies. Affected by policy changes, the pilot enterprise in Tieshan district, Huangshi city of Hubei have adjusted their technical upgrading plan. However, this report and action plan is not revised accordingly due to the time reason.

Annex 9.1.3

Explanation for modifications in energy efficiency VA

After the second progress report was completed, the subcontractors discussed with the project CTA, PIC and PMO on the Vas developed, and heard their comments. We also approached VA experts of Ecofys bv and LBL for their advice. Based on the comments and advice, revisions and modifications were made to make it more practicable and realistic to be a model text for TVEs. Revisions were made in the following aspects.

1. Target of energy conservation re-designed:

Field surveys and investigations show that most TVEs apply simple process and make single product. There are few technical upgrading choices for them, and once upgrading is carried out, it will be very easy to fulfill the original target. The target, then, is divided into two parts: one for technical upgrading and the other for end of the UNDP/GEF project. In this way, monitoring and evaluation will be more effective. This is where the target of energy conservation is changed.

2. More details are added to some ambiguous clauses, making them more clear and cut. For instance, in "Revision and Termination", "other contingent factors" are deleted, and "preferential policies" are more specific now.

3. Clauses that are not practicable are revised or deleted to make the agreement more workable. In "target of energy conservation", for instance, parts of stipulations concerning EEI correction are cut off.

4. In the clause of "monitoring and evaluation", measures to be taken when the target is not fulfilled is put according to international experts, Ms. Lynn Price and Mr. Ernst Worrel.

5. Some data are corrected and verified.

Annex 9.2.1

Statute of Xinjin Policy Implementation Committee

Introduction

Clause 1 Nature

Xinjin Policy Implementation Committee (hereinafter referred to as Xinjin LPIC) is an institution led by the Xinjin county government, which is established to help brick making and metal casting TVEs in the county to remove policy barriers in applying energy efficient technologies.

Clause 2 Objective

The objective of Xinjin LPIC is to promote energy efficient technologies in the brick making and metal casting 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 county.

Organization of Xinjin LPIC

Clause 3 Member organizations

Xinjin LPIC is comprised of representatives from the County TVE Bureau, the County Bureau of Environmental Protection, the County Bureau of Building Planning, the County Office of Wall Materials Reform and the County Bureau State Land Resources.

Clause 4 Delegates

Xinjin LPIC shall have 5 delegates, who should be directors of the

above-mentioned 5 local government authorities.

Clause 5 Term of service

Xinjin LPIC delegates, to be nominated by the county 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 county government for approval.

Clause 6 LPIC Directors

The deputy county governor in charge of industries shall take the post of Director, and a deputy director of the County TVE Bureau shall take the post of Deputy Director. The Deputy Director can act as Director in his absence. In addition to the normal duties and obligations of a member of Xinjin LPIC, the Director (or acting Director) chairs meetings of Xinjin LPIC, signs Minutes and formal correspondence of Xinjin LPIC.

Clause 7 LPIC Office

The Xinjin LPIC Office is responsible for the administrative routine activities of Xinjin LPIC and communications with the PIC and the project management office of the UNDP/GEF Chinese TVEs Project. The Office is established within the County Government Office at the address of No. 34, Huifeng Road., Xinjin County, Chengdu City.

Clause 8 Office staff

The office staff includes experts in local policy issues, the director and a deputy director of the TVE Bureau Office.

Functions of Xinjin LPIC

Clause 9 The major responsibility of Xinjin 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 metal casting industry of the

county, and to remove policy barriers encountered in the process.

1. Xinjin LPIC will develop and implement action plan aimed at promoting regulatory reform with TVEs in the county, and market transformation of energy efficiency technology and projects.
2. Xinjin LPIC will promote Energy Efficiency Voluntary Agreement (VA) to be signed by and between the local government and TVEs.
3. Xinjin LPIC will regularly provide TVEs with information about updated energy efficient technologies and related policies both inside and outside China.
4. Xinjin LPIC will promote in the county better enforcement of existing national policies for technical upgrading, energy conservation and environmental protection.
5. Xinjin LPIC will establish incentive mechanism to promote energy efficient technologies, and have best practices in energy conservation and emissions reduction replicated throughout the county.
6. Xinjin 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 County TVE Bureau assumes the responsibility of organization and coordination activities as well as the administration of all brick making and metal casting TVEs in the county.
2. The County Bureau of Building Planning, the County Office of Wall Materials Reform and the County Bureau of State Land Resources are responsible to provide technical support to brick making and metal casting TVEs applying energy efficient technology.
3. The County Bureau of Environmental Protection will provide guidance to brick making and metal casting TVEs in the aspect of policies and emissions standards, and will conduct environmental evaluation of the

TVEs.

Governance and working procedures

Clause 11 Modality of operation

Xinjin LPIC will operate by means of meetings, once half a year. The Director, or the 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. Xinjin LPIC reserves the right for the explanation of this statute.

Annex 9.2.2

Action Plan of the LPLC of Xinjin County, Sichuan 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.

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 PLC 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 PMC of Xinjin county in Sichuan province has formulated the action plan.

2. Obstacles to Adopt Energy Efficiency Technologies

For Xinjin county's Brick industry, the market, policy, technical and financial obstacles to adopting energy efficiency technologies are as follows:

① The enterprises have no energy management system;

② The brick industry has no professional experts and no energy efficiency supervisor;

③ There are difficulties in obtaining and evaluating information on energy efficiency technology;

④ Since the quality of the brick is low, facing brick has to be used in architectural building. This has increased the architectural cost and caused energy waste;

⑤ The enterprises have difficulties in obtaining finance because they have no land tenure right and have no capital for mortgage.

3. Objective

(1). Short-term objective（2003-2005）

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

② To upgrade the energy efficiency technologies and the objective is to reduce energy consumption per unit product (or production value) by 12%;

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 2002 (baseline), the ultimate objective is to reduce energy consumption per unit product (or production value) by 15%.

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 sign EE Voluntary Agreement with demonstration enterprises.

Time: July 2003—December, 2008

Objective: government sign Energy Efficiency Voluntary Agreement with demonstration enterprises; 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 12%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product (or production value) 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 consult with local government and formulate incentive policy;

④ Work out Energy Efficiency Voluntary Agreement draft 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 Xinjin county's brick industry.

（2）Establish local expert group for Xinjin county's brick industry and strengthen capacity building

Time: December 2003-June 2004

Objectives: According to the technical reality of the local brick industry, technicians selected from Xinjin county brick factories shall be organized for capacity building. This will provide personnel resource for energy efficiency and for removing market, policy, technical and financial obstacles.

Tasks:

① In December 2003, a local expert team is be formed, consisting 5 technicians selected from different local brick enterprises

② Provide training for expert team members

Time: February 2004

Locus: Xinjin county of Sichuan Province

Contents:

a. The development trend of brick industry

b. The practical technologies of brick industry

c. Laws, statutes and technical standards related to brick industry;

d. Energy efficiency management for brick industry.

③ Establish Energy Efficiency supervisor system in brick factories

Time: February-August 2004

Tasks:

a. Local expert team members participate in the above-mentioned training and establish supervisor system (draft) according the enterprises' realities.

b. Operate according to the system and make records.

c. Compare energy efficiency situations before and after establishing the system.

d. Find out the system's shortcomings and revise the system accordingly and form formal system.

e. Exchange the experiences accumulated from implementing Energy Efficiency supervisor system within Xinjin county.

（3）Establish local brick industry Energy Efiiciency network

Time: December 2003-June 2004

Objectives: Based on Sichuan Wall Material Scientific and Technical Information Net, establish brick industry Energy Efficiency website and make full use of the advantages of internet to exchange the new mechanism, new information, new methods and new technology that can be utilized to remove the obstacles. Organize those high energy consumption and heavy pollution enterprises by Internet and conduct activities of energy efficiency and CO2 emission reduction and increase the enterprises' overall competitiveness.

Tasks:

① Establish a policy column to publish the national and local laws and statutes on energy efficiency and GHG emission reduction;

② Establish an information column to follow up the progress of energy efficiency and GHG emission reduction;

③ Organize technical forum and propose suggestions on energy efficiency and GHG emission reduction for Xinjin county's brick industry and offer reliable technical support for enterprises.

④ **Organize the enterprises to implement** energy efficiency and GHG emission reduction activities and publish the related information to the public. In this way, those enterprises that have done well shall be motivated and others shall be urged.

（4）Policy recommendations

Time: July-September 2003

Objectives: Propose to Chendu Wall Rebuilding Office to improve the quality of brick and promote dry walls among Chendu's architectural industry. In this way, the policy shall demonstration the market and the market shall lead enterprises to conduct energy efficiency and GHG emission reduction activities.

Tasks:

① Organize experts to survey Chengdu's market for brick, energy consumption status of brick industry and the phenomenon of tile facing on architectures.

② Compile survey reports.

③ Conduct workshops and put forward policy recommendations to improve brick quality and promote the extension of dry walls.

④ Report the policy recommendations to Chendu Wall Rebuilding Office;

（5）Favorable policies for those enterprises that sign Energy Efficiency Voluntary Agreement

Time: July 2003–December 2005

Objectives: Favorable policies for those enterprises that sign Energy Efficiency Voluntary Agreement

Contents:

① With the influence of GEF project, win credibility surety fund for those medium and small scale enterprises that sign Energy Efficiency Voluntary Agreement.

② Guide the enterprises to conduct energy efficiency and GHG emission reduction activities and accelerate the depreciation of the equipment listed in government's clean production catalogue.

③ The cost used for energy auditing and training is to be listed in enterprises' running expenses.

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.

(6) Strengthen publicity and extension

Time: December 2004-2008

Objectives: Publicize energy efficiency and extend Energy Efficiency Voluntary Agreement

Actions:

① Strengthen energy efficiency publicity

In December 2004, Energy Efficiency Publicity Week in Xinjin County shall be conducted. About 200 banners shall be hung in 200 main roads and energy efficiency ideas shall be publicized. Those demonstration enterprises that sign Energy Efficiency Voluntary Agreement shall be introduced to the public.

② In April 2005, 200 pamphlets on ISO9000 shall be printed. This shall help to

improve the enterprises' management level and their awareness in energy efficiency technological upgrading and lay a basis for carrying out the environment protection management standards listed in ISO14000.

③ In December 2006, organize an 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 demonstration enterprises to PMO according to project requirements.

⑤ In January – December 2008, environment protection management standards listed in ISO14000 shall be carried out in 1-3 enterprises.

(7) Reward system

① Recommend enterprises to participate in the appraisal of Advanced Enterprise;

② Commend and award those groups or individuals that contribute greatly to research, development and extension of energy efficiency technologies.

5.Follow-up and report of the action plan

According to local realities, LPIC formulates report on the previous year's work every January and works out *Annual Working Plan of LPIC of XinjinDistrict, Chengdu City* (Refer to the attachment for detailed form). The report is to be submitted to national PIC secretariat before January 31. The secretariat is to collect all the submitted reports and reports to MOA's GEF office. All the reports are to be evaluated by the office and each action plan shall be revised according to the evaluation results.

Annex 9.2.2.1

Report on Study Tour of LPIC in Xinjin County of Sichuan 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 their production and marketing of Xinjin brick 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, with workshops, on-the-spot investigation and questionnaire answering activities employed, led by Ms. Wang Guiling, PMO deputy director, consisting of Ms. Wang Hui, subcontractor manager, subcontractor experts and technical professionals, went to Xinjin county, Sichuan province and conducted a five-day tour from July 27-31, 2003 (See attachment for detailed activities and name list of the participants). In order to guarantee the quality and effectiveness of the tour, Dr. Zhang Zhihong UNIDO Chief Technical Advisor and Ms. Dian, Netherlands Volunteer Expert had been invited to participate in the tour.

1. Brief Introduction of Brick Industry in Xinjin County

Xinjin County is located 28 km south of Chengdu, the capital of Sichuan province and 18 km away form Chengdu Shuangliu International Airport. It covers an area of 330 km^2, including 250-thousand mu arable land and the total population of the county is 285 thousand.

Table 1: Basic Data on Brick Industry in Xinjin County

	Unit	Brick industry		TVEs		Percentage of brick industry to TVEs in 2002
		2001	2002	2001	2002	
Number of Factories	--	5	7	1828	1869	0.37
Total output value	10,000 Yuan	1672	2087	376534	417040	0.50
Initial fixed capital	10,000 Yuan	1832	2356	123148	146981	1.60
Staff employed	Person	1219	1340	35772	35465	3.80

Clay brick and shale brick are the two major varieties produced by Xinjin brick industry. Since early 1990s, Chinese government has begun to popularize the conception of protecting arable land and forbid to produce and use clay brick. Since the end of 1990s, the factories of clay brick have begun to shrink and disappear. Now Xinjin have 20 clay brick factories among which 9 have certificates or official approval for producing while the other 11 have not got such certificate. By the end of year 2005, all clay factories will have been closed. Due to the policy adjustment and facing the compulsory closing

date of year 2005, there is no statistics on clay brick industry of Xinjin County.

Shown in table 1, the total output value of the value of brick industry in 2002 is 20.87 million Yuan, accounting for 0.5% of the total value of township and village enterprises (TVEs) which amounts to 4.17 billion Yuan and. Among the 35465 people employed by local TVEs, there are 1340 employed by brick industry, accounting for 3.8%.

Xinjin County enjoys rich shale resource that is distributed in barren mountain and wild land. The brick factories in Xinjin County have depended on shale as raw material because the reclaiming of the mined areas needs little efforts. There are 7 factories engaged in the production of shale brick and the total output value amounts to 20.87 million Yuan, accounting for 8.5% of the total production of the county's Constructional Materials Industry (CMI).

There are 1340 staffs in the factories, covering 26.7%of the CMI industry. The annual output of fired shale products equivalent has reached 209.88 million pieces of standard brick.

Table 2: Basic Data of Shale Brick Industry and Constructional Materials Industry in Xinjin County

	Unit	Brick industry		Constructional Materials Industry (CMI)		% of brick industry to CMI in 2002
		2001	2002	2001	2002	
Number of Factories	--	5	7	22	24	29
Total output value	10,000 Yuan	1672	2087	22672	24500	8.5
Initial fixed capital	10,000 Yuan	1832	2356	13832	15400	15.3
Staff employed	Person	1219	1340	4880	5012	26.7

Shale brick firing industry is one of the major energy consumers in Xinjin County. In 2002, the total energy consumed reached 24,976 tons of coal equivalent and 62,440 tons of CO_2 was emitted. So the adoption of technologies aiming for energy efficiency and CO_2 emission reduction in this industry will greatly improve the regional environmental quality.

The energy cost covers for 35% of total cost of brick industry in Xinjin country. The electricity price in Xinjin County is quite high, 0.6 –0.8 yuan/Kwh while the price in other area is only 0.4-0.5 yuan/Kwh. There are three reasons accounting for the high-priced power: firstly, the power used by the county is not supplied directly by Chengdu Power Bureau. During the peak power consumption hour, it was always switched off to restrict the use of electricity in order to ensure civil electricity supply. Secondly, the county's backward power infrastructure, the overloaded electricity grid and the low safety coefficient have led to unstable power supply. Thirdly, the industrial power consumption pattern is not reasonable and power waste phenomenon still exists. All these factors have increased the industrial cost and reduced the enterprises' market competitiveness.

Table 3: Energy Consumption and CO_2 Emission of Brick Industry in Xinjin County

	Unit	2001	2002
Output	10,000 pieces	17874	20988
Energy consumption Per Unit	Ton of coal equivalent / 10,000 pieces	1.18	1.19
Total energy consumption	Ton of coal equivalent	21091	24976
CO_2 emission	Ton	52730	62440

It has also been found out during the survey that both the local administrative departments and most factories engaged in shale brick have managed the constructional materials industry in an extensive way. The cost, energy and quality control are not administrated by scientific statistics, but by the managers' experiences, which lead to the shortage of statistics and energy-efficiency managing indicator.

2. Brief Introduction of the Pilot Enterprise

Yongxing shale brick factory, the pilot enterprise selected by the project, has been founded in 1985. The factory covers an area about 100 mu and has introduced T Rotary Kiln in a creative way. It annually produces shale brick of various kinds 80 million pieces. It has reclaimed about 103.5 mu lands since the founding of the factory and has been awarded the title of *the Second-grade Energy Efficiency Enterprise* by Ministry of Agriculture. It has passed the ISO9000 certification and the financial credibility of the factory is AAA.

The factory has used good shale as raw materials and the products include 3 kinds and 16 variety bricks. They are KP_1 circularly perforated and rectangle perforated brick, perforated modulus brick, non-load-bearing hollow bricks with more than 6 perforations and common solid brick of KF series. In 1992, the common shale brick produced by the factory has been awarded as *Chengdu's high-quality product*. 16 varieties of products of three series have enjoyed good reputation in constructional materials market.

On the base of the success achieved during the 1st phase, the project 2nd phase shall upgrade the solid shale brick production line to produce perforated brick, hollow brick and ornamental brick and achieve the aim of improving product's quality, promoting energy efficiency and reducing GHG emission.

Wide tunnel kiln shall be used for firing. Heat insulation measures, temperature adjustment and control system shall be adopted to improve the heating efficiency of the kiln and also lay basis for the production of dry walls in the future. The technical upgrading of the factory requires an investment of 5 million Yuan. The energy efficiency of the upgraded production lines are as follows: the changing of solid brick production to the production of perforated brick (void ratio 25%) and hollow brick (void ratio 45-50%) shall reduce the consumption of coal by 25-30% and shale by 25%-30%. The discharge of SO_2 and CO_2 shall be decreased by 25%-30%. Suppose coal consumption for producing

solid brick is 1.6 ton per 10,000 pieces, the annual production of 40 million brick (converted into common brick) shall save 1600-1920 tons of coal equivalent. As tunnel kiln can strengthen heat insulation, coal can be further saved.

Table 4: Comparison before and after Upgrading

	Before Upgrading	After Upgrading
Product varieties	Solid brick	Perforated brick, hollow brick and ornamental brick
Product price	Common perforated brick 0.17Yuan/piece	0.45Yuan/piece of KP1 ornamental brick
Production processes	Rotary kiln	Tunnel kiln

Besides, from the perspective of architectural energy efficiency, the replacement of solid brick by perforated brick (void ratio 25%, 240mm thick wall) shall save energy used for heating in winter or cooling in summer by 25%. At least 4000-4800 tons of CO_2 emission shall be reduced. The implementation of the 2nd phase project shall effectively utilize local shale resource and reduce GHG emission. It shall also have significant demonstrative effects for factories that use local shale resource in the southwest China.

3. Administration System of Brick Industry and LPIC Building

Xinjin County TVEs Bureau supervises the TVEs in Xinjin County. The bureau also supervises and serves local medium and small-scale enterprises and nongovernmental businesses. The brick industry of the county has been administratively managed by the TVE Bureau and professionally guided by local Wall Reconstruction Office and Architecture Planning Bureau.

In addition to supervising and serving all the local TVEs, Xinjin County TVEs Bureau has focused on serving the major industries and enterprises engaged in producing constructional materials, food, machinery, leather, etc. The Leadership and Coordination Group for Major Enterprises, headed by a deputy head of the county, has been established and effectively promoted the local economic development.

In order to provide better service for local enterprises, Xinjin County TVEs Bureau has supported the establishment of three trade's societies, including Xinjin County Architecture and Constructional Materials Association.

In spite of that, there is no governmental organ in the county that specifically engaged in helping enterprises to adopt technologies for energy efficiency and GHG emission reduction and helping them to overcome the policy obstacles confronted during the adoption of these technologies.

After the implementation of the project during the first phase, local authorities have realized the importance of energy efficiency and GHG emission reduction. According to the second phase project documents and local realities, Xinjin County TVEs Bureau has established LPIC. Coordinated by the TVEs Bureau, different departments have responded actively to LPIC and expected objects have been realized.

4. Property Right of Xinjin County's Shale Brick Industry

Property right reform has been conducted since reform policy being implemented in rural China. At the beginning of reform, most brick enterprises were collective-owned enterprises (established by farmers from town, village or villager groups). In 1998, TVEs began to be transformed to joint-stock and cooperation enterprises (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). Later the enterprises to limited liability companies (established and invested according to law by stockholders and the responsibility of stakeholder is limited to the amount of his shares). By the end of 2002, there have been 748 non-public ownership enterprises, accounting for 90% of the county's total enterprises. 104,000 people have been employed by these non-public ownership enterprises. Taxes paid by these enterprises accounted for 75% of the industrial and commercial taxes in the county and their output accounts for 80% of the county's GDP.

The seven shale brick factories had been reformed into limited liability companies by 1998.

Property right reform has greatly promoted the development of Xinjin building materials industry. The tax turnover of the industry has grown by 16.8%, total output value by 7.9% and the number of people employed by 7.8%.

Table 5: Comparisons of building materials industry before and after Property Rights Reforms

	Unit	Before (1997)	After (1998)	Increase or Decrease
Tax turnover	10,000 Yuan	3683	4302	16.8%
Total output value	10,000 Yuan	21500	23200	7.9%
Staff employed	Person	2895	3122	7.8%

The reform and consummation in property rights system put new vigor for the factories' development and promoted the self-decision-making in the technical innovation. The government's interference has been reduced and enterprises can make their own decisions rapidly according to market demands, perusing for more interest. Property rights reform give propelling power to the enterprise for technical upgrading. Property reform also increased enterprises' financing capacity by connecting the financing with cost and interest of investors directly. After the property reform, fixed asset of the enterprise have increased by 7.9%.

5. Relevant Policies on Brick Industry in Xinjin County

1) Prohibition of Production and Use of Solid Clay Brick

On May 21, 2003, Chengdu Municipal government issued *Provisional Measures on Prohibiting Production and Use of Solid Clay Brick in Chengdu.* It said, since June 1, 2003, the production and use of solid clay brick should be prohibited. Within Chengdu's administrative region, no project shall be passed for newly building, rebuilding or expanding solid clay brick production lines. Those enterprises

that get soil from arable shall be closed and the production of those that get soil from non-arable land shall be stopped by December 31, 2005. In order to reinforce the effect of the *Provisional Measures on Prohibiting Production and Use of Solid Clay Brick*, it also made some stipulations on responsibilities and punishments for institutions engaged in designing and constructing solid clay brick production lines.

Xinjin County has actively implemented the above-mentioned document and made a survey of the 20 clay brick factories in the county. The *Implementing Opinion on Provisional Measures on Prohibiting Production and Use of Solid Clay Brick* was formulated on May 29, 2003. Responsibility contracts were signed between the county government and governments at township level. 11 solid producing factories without certificate for clay mining were closed and the other 9 qualified enterprises should be closed before certain appointed dates. The laid-off workers and the collective property also have been carefully arranged.

2) Levying Only Half of the Value-added Tax

According to the *Notice on Levying Value-added Tax for Utilization of Some Resources and other Products*, which was issued by Ministry of Finance and State Administration of Taxation of China on December 1, 2001, some new wall materials and products such as shale brick shall enjoy the favorable policy that only half of the value-added tax shall be levied. The policy was vigorously implemented in the 6 surveyed enterprises in Xinjin County.

The implementation of the P*rovisional Measures on Prohibiting Production and Use of Solid Clay Brick* has restricted the production and marketing of the solid clay brick. The supplementary policies such as levying half of the value-added tax for shale brick and levying all the value-added tax for solid clay brick, has discouraged the production of solid clay brick. The solid brick has been forced out of Chengdu market. The former 33% market shall enjoyed by solid brick has been replaced by shale brick and there is a promising market for the production of shale brick.

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 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.

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.

According to the newly issued Regulation on Collecting and Using Pollution Fee and the Implementing Method formulated by some provincial department, Xinjin County has worked out the specific way to collect SO_2 pollution fee. Formerly, based on total coal consumption and its S content and the unit fee of 15 Yuan per ton of coal, the total fee paid for SO_2 emission can be calculated. Now the fee is paid according to the actual SO_2 emission amount tested by local environment protection administration. The unit fee standard for SO_2 emission is 0.2 Yuan/kg in 2003, 0.4 Yuan/kg in 2004 and 0.6 Yuan/kg in 2005. According to this standard, the SO_2 fixed in brick shall be excluded and the way to calculate the pollution fee shall be more scientific and reasonable.

Xinjin Environment Protection Bureau has a good understanding of the technical and financial situations of the Xinjin brick industry. So during their execution of the abovementioned policies, they demanded the enterprises to obey the "Three Qualifications" when they build, rebuild or expand their production.

7. Technology Status of the Brick Industry in Xinjin County:

1) Currently Adopted Technologies

The production line in the pilot enterprise is designed by experts and has done the energy balancing. The other enterprises just design their own line referring to the technique and equipment of the pilot enterprise. The brick enterprises in Xinjin County have no other fixed source of technical information on energy efficiency and GHG emission reduction except from the pilot enterprise. Among the five non-pilot enterprises, no technology comes from technical market, Internet or patent market. These enterprises know little about the scientific institutes and lack the channel to obtain technologies and information of energy efficiency and GHG emission reduction.

2) Technical Service for Energy Saving and Emission Reduction

According to the information provided by Xinjin County TVEs Bureau, there is no brick manufacturing major in colleges and universities. The major related to this industry is silicate and cement major. It shall take 2 years even for professionals from these two majors to grasp the skills of technologies of brick manufacturing.

From the following table, it can be seen that there is a shortage in the technical personnel. Although every enterprise has its own professionals, they are busy dealing daily productive activities and have no time to learn energy efficiency and GHG emission reduction technologies. The studying of these technologies is regarded as individual affairs. There is a construction society in the county, but the technical professionals seldom participated in its activities.

Table 6: Statistics of the Technical Personnel in Brick Industry

		Percentage (%)
Total number of staff Employed	1340	
High professional title	0	0
Medium professional title	0	0
Preliminary professional title	1	0.1
Graduates from colleges or universities	1	0.1
Junior or senior high school	646	48.2

3) Little Attention been Given to energy Efficiency

According to the survey results, energy consumption has accounted for 35% of the total cost in brick industry and this proportion is very high. But since there is huge market demand, the enterprises can earn enough profits even with such high energy cost. Although enterprises are willing to increase their energy efficiency and reduce their energy cost, the investment in technical upgrading is huge and they would rather pursue short-term benefits than invest in technical upgrading.

4) Lack of motivation for adopting new technologies

Xinjin County is located between rural and urban areas. Although the market demand for the quality of the brick varies greatly, most brick users in countryside and small towns prefer low-quality brick because of their low-income level. So there is a promising market demand for low-quality brick.

Since there is little supply of high-quality brick in the market, those consumers that need to use high-quality brick have to use face tile on the surface of the building made of brick in order to guarantee the appearance effect of the building. The manufacturing of common brick and face tile has caused double energy consumption and waste.

This led to a dilemma in market: no high-quality brick is used to face wall; the manufactures do not need to produce high-quality brick to survive and the low-quality brick produced has to be used to face walls.

The low-grade and low-quality brick can't be directly used to build dry wall. The competition at low price level has made it impossible for the enterprises to get desirable profits and this subsequently hampers the enterprises' investment in technical upgrading and discourages their motivation in adopting energy efficiency technologies.

8. The Financial Status of the Brick Industry in Xinjin County

The brick industry in Xinjin County has started when China's economic reform just began. 80% of the fund has come 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 funds used for technical upgrading has been collected by the 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. These 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 shale 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.

In order to promote the financing of the medium and small-scale enterprises, Chengdu municipal government has formulated *Opinions on the financing of the medium and small-scale enterprises ([2002] 40)* on December 26, 2002. In this document, there are clear items on the principles, objectives, financing object, conditions and major measures for financing medium and small-scale enterprises. Support fund has been established to promote the financing of the medium and small-scale enterprises. In 2003, 80 million Yuan has been set aside by the public finance as exclusive fund for financing medium and small-scale enterprises in Chengdu. Financing credibility system, mortgage system and loan risk sharing mechanism has also been established.

In order to reinforce the effect of the above-mentioned document, on April 29, 2003, Chengdu municipal government issued *Notice on printing and distributing 5 supplementary documents on financing medium and small-scale enterprises.* The five documents include: *Implementing Rules on Promoting Financing Medium and Small scale Demonstration Enterprises in Chengdu; Rules on Levying and Managing Exclusive Fund for Financing medium and small scale enterprises in Chengdu; Provisional Rules on pilot charging for Financing medium and small scale enterprises in Chengdu; Implementing Rules on Mortgage for Financing Medium and Small scale Demonstration Enterprises in Chengdu* and *Implementing Opinion on Building Information Reserve for Financing Medium and Small scale Demonstration Enterprises in Chengdu.*

Xinjin County has actively implemented the above-mentioned documents and 30 million Yuan has been set aside by local public finance in 2003 as exclusive fund for financing medium and small-scale enterprises in Xinjin County.

It has been clearly indicated by Xinjin county TVEs Bureau that it shall assist pilot enterprises to apply for exclusive fund after they sign Voluntary Agreement. The formulation of the above-mentioned policy shall promote the financing of energy efficiency technology upgrading in brick industry.

9. Sichuan Wall Material Scientific and Technical Information Net

As the sub-website under National Wall Material Scientific and Technical Information Net, Sichuan Wall Material Scientific and Technical Information Net was founded 26 years ago and has been guided by former Information Management Division of Sichuan Provincial Constructional Materials Bureau and supported by Xinjin County's Yongxing Shale Hollow Brick Co., Ltd. The website has focused on national policy and industrial development need. A series of useful activities have been conducted, such as technical exchanges, extension, training, technical diagnosis, printing and distributing technical materials, exchange and extension of new technology, new processes, new products and new equipment. It has been awarded the title of *Excellent Provincial Website* by National Wall Material Scientific and Technical Information Net. A number of experienced experts have worked for the net. Among the 6 industrial experts that have been elected by the 2001 National Brick Conference, 4 are from the Net.

However, the website has little influence in Xinjin County. Among the 6 enterprises that were present at the meeting, there are only 3 enterprises that have participated in the activities held by it. With further support and guidance from government departments, establishing a new energy efficiency website on the base of the Net, will greatly promote the development of brick industry in Xinjin County.

10. Conclusions and Recommendations

Conclusions:

1) The implementation of the 2nd phase project will make full use of the local shale resources and reduce the GHG emission. This will bring a positive demonstrating effect for those enterprises that engaged the production with the rich shale resources in southwestern China.

2) Local government support the establishment of LPIC, which makes a good base for the smooth implementation of LPIC according to the activity plan.

Recommendations:

1) Establish energy supervisor system

Brick industry is a high energy consuming industry. The designation of a full-time energy supervisor shall promote the exchanges of energy efficiency information with external world. Energy consumption shall be regularly measured and calculated and energy management and monitoring shall be conducted.

2) Conduct training

Establish a group consisting of professionals from Xinjin County's brick industry and conduct domestic and international study tour and personnel training.

According to the technical reality of the local brick industry, technicians selected from Xinjin county brick factories shall be organized for capacity building. This will provide personnel resource for energy efficiency technical upgrading and for removing market, policy, technical and financial obstacles.

3) Establish energy efficiency website for brick industry

On the basis of Sichuan Wall Material Scientific and Technical Information Net, make full use of the

advantages of Internet to exchange new mechanism, new information, new methods and new technology that can be utilized to remove the obstacles. Organize those high-energy consumption and heavy pollution enterprises by Internet and conduct activities of energy efficiency and CO_2 emission reduction and increase the enterprises' overall competitiveness.

4) Extend the use of dry wall

Promote the marketing of the dry walls among construction area in Xinjin County or even in Chengdu.

5) Increase the number of pilot enterprises

With the reputation support of GEF project, help medium and small-scale enterprises to apply for loan, technical upgrading fund and wall rebuilding fund.

(6) Promulgate ISO9000 and ISO14000 certification

Improve the enterprises' management ability and aware their energy efficiency and environment protection conception.

Annex: Schedule for Study Tour of Casting Industry in Xinjin County, Sichuan Province (July 27-31, 2003)

Time	Subject	Activity	Locale	Participants
July 27	Working meeting in xinjin County	Confirm study tour itinerary and other affairs	Hotel	PMO, CTA, members of subcontractor expert group, local policy experts and industrial professionals
July 28	Workshop with Casting producers of Xinjin County	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, CTA, Dian, members of subcontractor expert group, local policy experts and industrial professionals and directors from 6 Xinjin Brick Factories.
July 29	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 those about wall materials 4. The willingness of the involved stakeholders to participate in project implementation and support they possibly provide for the project.	Hotel	PMO, PIC, subcontractor expert group, LPIC representatives from TVEs Bureau, National Land Administration Bureau, Wall Reconstruction Office, Architecture Planning Bureau and Environment Protection bureau and local policy experts.
July 30 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, subcontractor expert group, LPIC representatives from TVEs Bureau, National Land Administration Bureau, Wall Reconstruction Office, Architecture Planning Bureau and Environment Protection bureau and local policy experts.
July 30 PM		Discuss the items of Voluntary Agreement	Hotel	
July 31	Visit to governmental departments	Collect local laws and policies	Government departments	PMO, CTA, Dian, subcontractor expert group and local policy experts

Annex 9.2.3

Energy Efficiency Voluntary Agreement

BETWEEN

Government of Xinjin County, Chengdu City, Sichuan Province
(Hereinafter referred to the Government)

AND

Yongxing Shale Brick Co Ltd in Xinjin County, Chengdu City, Sichuan 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. 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 12%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 15%.

Indirect Energy Efficiency targets: through production of new energy-conservation products to save raw material by 25% and decrease

energy consumption of buildings by 25% when products are utilized.

2.3 Because the government adopts stricter environmental standard and more energy is consumed, the targets shall be adjusted if the following 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 help the implementation of the national policy on tax reduction or exemption related to production of new wall material products. 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. In order to support the Demonstration Enterprise and other shale brick companies to enlarge their market share, the Government committed to officially ban the production and marketing of clay solid brick within Xinjin County by the date of December 31st, 2005 .

4.4. 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 Xinjin County, Chengdu City, Sichuan Province (seal)	Yongxing Shale Brick Co Ltd, Xinjin County, Chengdu City, Sichuan Province (seal)
Authorized representative	Authorized representative
Date:	Date:

— 国家有关能源和环境的法律、法规和政策与协议签定年相比发生明显的变化；

— 由于实施了本协议，对试点企业的业务经营与正常发展产生了不利的影响；

本协议自签订之日起生效。2008 年 12 月 31 日终止。协议中未尽事宜，须经双方共同协商，作出补充规定。补充规定与本协议具有同等效力。

四川省成都市新津县人民政府（盖章）

授权代表：

日期：2014年4月7日

四川省成都市水兴页岩砖有限公司

（盖章）

授权代表：

日期：2014年4月2日

Appendix:

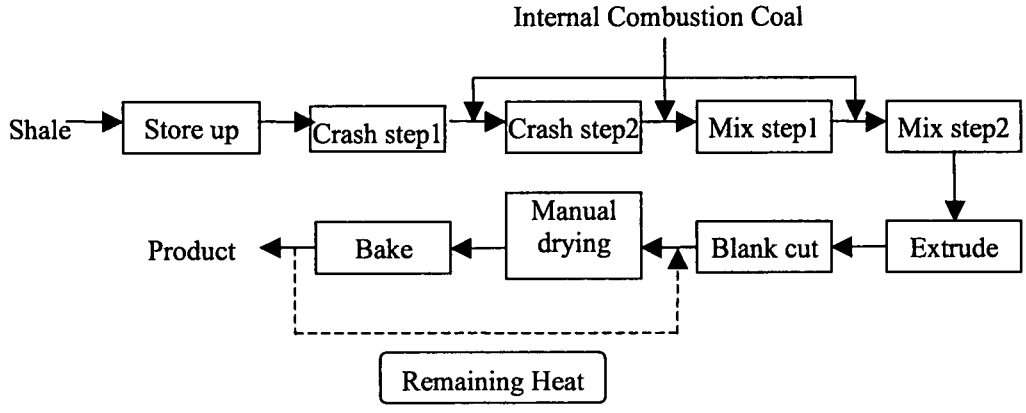
Yongxing Shale Brick Co Ltd

Energy Conservation Plan

2 Brief Introduction of the Enterprise

The demonstration company uses high-quality shale as the raw material. The major products are KP1 hollow brick, modulus hollow brick, KF series of air brick, and solid standard brick. The annual production is about 80 million bricks. The products can be used for frame filling in high buildings and other energy-conservation building with brick-concrete structure..

The technical process is:



3 Energy Consumption of the Enterprises

Energy Consumption in 2002

Type of Energy	Consumption Quantity	Coefficient	In tce	CO_2 Emission ($t\text{-}CO_2$)
Coal (t)	12,996	0.6857	8,912	22,218
Electricity (kWh)	2,430,000	0.383×10^{-3}	928	2,315
Total			9,840	24,533
Production (10k standard brick)			7,014	
Energy Consumption per unit product (tce/10k standard brick)			1.40	

4 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 (or production value) by 12%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 15%.

5 Measures for Energy Conservation

5.1 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.	

5.2 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	

5.3 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	Adopt high-speed pulverizer to reduce the material granularity to less than 1mm.	1200~1440	2992~3590	2004/6-2004/12
2	Build storeroom of 800 m^2, the raw material will be stored for more than 3 days before used			
3	Use high-pressure vacuum squeezer to improve the quality of blank			
4	Improve the equality of baking, improve the quality of brick and reduce energy consumption. Adopt heat insulation measures and temperature control system to improve thermal efficiency.			
5	Produce hollow brick with hole ratio from 45% to above 60%.			

6 Expected Output

Energy Conservation Measures	Expected Energy Conservation	CO_2 Emission Reduction (t/a)

	(tce/a)	
Energy Management & common measures	295	735
Energy Conservation & Technical innovation	1200~1440	2992~3590
Replacing solid brick with hollow bricks with hole ratio of 25% in building 240mm-thick wall will save energy by 25% for heating in winter and air conditioning in summer	—	—
Save ceramic tile of 156,000 m^2	2650	6606
Total	4145~4385	10333~10931

Basic Information of the Demonstration Enterprise

Name: Yongxing Shale Brick Co Ltd							
Address: Shuangjiang Village, Xinjin, Chengdu, Sichuan Province						Zip: 611437	
Ownership: Stock Share						Established in: 1992	
Contact: GONG Muquan			Tel: 028-82420301			Fax: 028-82420301	
Information on Enterprises Quality							
Honors	Types	Name of Honors	Issued by			Date	
	Province level	Winner Enterprise					
Certifications	Type	Name	Validation date			Products	
	Quality Control System Certification	ISO9000：2000	2002			Shale Brick	
Year		2000		2001		2002	
Product	Product type	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)
	Hollow brick	1174	809	1985	879	2590	912
	Solid brick	4056		2695		2611	
	Air brick			5577m^3			
Energy Consumption							
Year		2000		2001		2002	
Energy Consumption		Quantity	Coefficient	Quantity	Coefficient	Quantity	Coefficient
Coal (t)		12857	0.6857	10731	0.6857	12996	0.6857
Electricity (10k kWh)		234.41	0.383	245.27	0.383	242.41	0.383

Annex 9.3.1

Statute of Dalian Policy Implementation Committee for Energy Conservation and Environmental Protection in Metal Casting TVEs

Introduction

Clause 1 Nature

Dalian Policy Implementation Committee for Energy Conservation and Environmental Protection in Metal Casting TVEs (hereinafter referred to as LPIC) is an institution led by the Dalian municipal government, which is established to help metal casting and cement TVEs in the municipality to remove policy barriers in applying energy efficient technologies.

Clause 2 Objective

The objective of LPIC is to promote energy efficient technologies in the industries of metal casting and cement, 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 municipality.

Organization of LPIC

Clause 3 Member organizations

LPIC is comprised of representatives from the Municipal TVE Bureau, the Municipal Bureau for Environmental Protection, Municipal Bureau for Science and Technology and the Municipal Office for Finance.

Clause 4 Delegates

LPIC shall have 4 delegates, who should be department directors of the above-mentioned 4 local government authorities.

Clause 5 Term of service

LPIC delegates, to be nominated by the local 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 municipal government for approval.

Clause 6 LPIC Directors

The director of the Municipal TVEs Bureau shall take the post of Director, and its deputy director shall take the post of Deputy Director. The Deputy Director can act as Director in his absence. In addition to the normal duties and obligations of a member of LPIC, the Director (or acting Director) chairs meetings of LPIC, signs Minutes and formal correspondence of LPIC.

Clause 7 LPIC Office

The Office is responsible for the administrative routine activities of LPIC and communications with the PIC and the project management office of the UNDP/GEF Chinese TVEs Project. The Office is established within the Municipal TVEs Bureau at the address of No. 39, Yingchun Street, Dalian.

Clause 8 Office staff

The office staff includes experts in local issues, the director and the deputy director of the Municipal TVE Bureau, and the deputy director of LPIC.

Functions of LPIC

Clause 9 The major responsibility of 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 municipal industries of metal casting

and cement, and to remove policy barriers encountered in the process.

1. LPIC will develop and implement action plan aimed at promoting regulatory reform with TVEs in the city, and market transformation of energy efficiency technology and projects.
2. LPIC will promote Energy Efficiency Voluntary Agreement (VA) to be signed by and between the local government and TVEs.
3. LPIC will regularly provide TVEs with information about updated energy efficient technologies and related policies both inside and outside China.
4. LPIC will promote better enforcement in the pilot city of existing national policies for technical upgrading, energy conservation and environmental protection.
5. LPIC will establish incentive mechanism to promote energy efficient technologies, and have best practices in energy conservation and emissions reduction replicated throughout the municipality.
6. 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 Municipal TVE Bureau assumes the responsibility of organization and coordination activities.
2. The Municipal Bureau of Science and Technology is responsible to provide technical support to metal casting and cement TVEs applying energy efficient technology.
3. The Municipal Bureau of Environmental Protection will provide guidance to metal casting and cement TVEs in the aspect of policies and emissions standards, and will conduct environmental evaluation of the TVEs.
4. The Municipal Office for Finance takes the responsibility to assist metal

casting and cement TVEs in sourcing funds for technical upgrading.

Governance and working procedures

Clause 11 Modality of operation

LPIC will operate by means of meetings, once half a year. The Director, or the 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. LPIC reserves the right for the explanation of this statute.

Annex 9.3.2

Action Plan of LPIC for TVEs' Energy Efficiency and Environment Protection in Dalian

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 casting 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 Dalian city has formulated the action plan.

2. Obstacles to Adopt Energy Efficiency Technologies

① The market demand is huge but the disorderly competition is quite damaging and there is no price self-discipline.
② Foreign businesses and China's trading companies have monopolized the external market information. As middle or low-level products, the castings' export price is quite low and it is very difficult to resist market fluctuations.
③ The cost of the castings has been very high due to low technical level, high rejection rate and high energy consumption;
④ The low ability to acquire and select information for energy efficiency technical upgrading.

⑤ TVEs have obstacles to get loan that has been designed by the state to support excellent casting enterprises to conduct clean production.

3. Objective

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

① The government sign *Energy Efficiency Voluntary Agreement* with demonstration enterprise.

② To conduct energy efficiency technologies upgrading and complete technical upgrading before December 31, 2005, with 2002 as baseline. The energy efficiency goals is that the energy consumption of per product decreases by 20%.

③ To establish an effective mechanism and lay sound basis for casting 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 the end of December 31, 2008, the ultimate objective of decreasing energy consumption of per product by 25% in demonstration enterprises shall be realized.

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

③ To extend the model to cement industry and to the industry of deep processing agricultural and sideline products

4. Implementing Plan

(1) Government signs EE Voluntary Agreement with demonstration enterprises.

Time: July 2003-December 31, 2005

Objective: government signs energy efficiency Voluntary Agreement with demonstration enterprises; technical upgrading shall be completed before December 31, 2005, with 2002 as baseline. The energy efficiency goals is that the energy consumption of per product decreases by 20% . By the end of December 31, 2008, energy consumption of per product decreases by 25%.

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 consult with local government and formulate incentive policy;

④ Work out energy efficiency Voluntary Agreement draft 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 EE 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 Dalian's casting industry.
⑨ Increase the number of demonstration enterprises.

(2) Establish Dalian Casting TVEs sub-Association under TVEs Association

Time: July 2004-december 2005
Objective: Directed by Dalian TVEs' Bureau, Dalian Casting TVEs subAssociation shall be established. The mission of the association is to provide service for mutual benefit of the casting industry by organizing the casting TVEs to find way to deal with various situations and cooperate together to achieve industrial self-discipline.

Tasks:

① Conduct surveys on Dalian TVEs that are engaged in casting industry

② Setup the leading group of the sub-association

③ Formulate constitutions for Dalian casting TVEs Sub-association

④ Report the preparatory work to Dalian TVEs Association for approval

⑤ Organizing the Setup meeting in Dec 2004, providing opportunity for membership enterprises to exchange their experience

⑥ Carry out detailed survey on Dalian Casting Industry in 2005

⑦ Bring up with development programme for Dalian Casting Industry in 2006

(3) Capacity building of Dalian casting industry for energy efficiency

Time: September 2004
Objective: The capacity building of Dalian TVEs that are engaged in casting industry is to remove the obstacles to energy efficiency technical upgrading; increase the casting industry's ability to acquire and select information for technical upgrading, improve the enterprises' technical level and reduce rejection rate, energy consumption level and production costs.

Training contents:

① The development trend of casting industry;

② The practical technologies adopted by casting industry;

③ Laws, regulations and standards related to casting industry;

④ Import and export practices.

(4) Organize trade fairs for order allotment

Time: March 2006
Objective: Open up external market forDalian's casting enterprise and determine lowest protection price for casting products according to market conditions.

Tasks:

① Learn casting product's market information from companies engaged in foreign trade;

② Make full use of the human power that can speak Japanese and Korean. Contact with Japanese and South Korean companies that specialize in casting. Introduce the Dalian casting industry's technical advantages and its LPIC to them. This shall help to know more about the export market.

③ Learn the foreign trade orders placed by Dalian casting industry.

④ Invite companies engaged in foreign trade, Japanese and Korean businessmen and Dalian's casting enterprises to conduct trade fair for order allotment

⑤ Summary

⑥ Try to regularize the trade fairs for order allotment

(5) Favorable policies for enterprises that sign EE Voluntary Agreement

Time: July 2003-December 2008
Objective: Encourage enterprises to conduct voluntary energy efficiency
Tasks:

① Organize demonstration enterprises to apply for the preferential policy

From March to June, 2004, organize demonstration enterprises to apply for the preferential policy according to the requirement, which was promulgated by Dalian Finance Bureau and Dalian TVEs' Bureau in July 2003. This shall help to win discount-interest loan for the demonstration enterprises' fixed capital investment for technical upgrading.

② In December 2005, continue to win for casting and forging enterprises the preferential policy of levying value-added tax and reimbursing it afterwards

According to the *Notice on levying value-added tax on castings and forgings and reimbursing it afterwards*, which was issued by Ministry of Finance and State Tax Administration, more excellent factories engaged in casting and forging production shall be encouraged to apply for the preferential policy of levying value-added tax and reimbursing it afterwards

③Clean production demonstration loan of Dalian Environment Protection Bureau by July 2003

According to the requirement of "tenth-five plan", 60% of the industries should realize clean production by the end of "tenth-five", Clean Production Demonstration Loan shall be used to encourage the enterprises that sign EE Voluntary Agreement to employ the Clean Production Scrutiny for energy efficiency and GHG reduction. Favorable policy such as accelerating the depreciation of the equipment listed in government's clean production catalogue

（6）small and medium scale enterprises' credibility guarantee fund

Time: March 2005- December 2007

Objective: With the influence of GEF project, try to win small and medium scale enterprises' credibility guarantee fund for those enterprises that sign Energy Efficiency Voluntary Agreement. To extend Energy Efficiency Voluntary Agreement mechanism to Dalian's casting industry.

Tasks:

① In March 2005, introduce Energy Efficiency Voluntary Agreement to 10 institutions engaged in small and medium scale enterprises' credibility guarantee and recommend to them the demonstration enterprises that sign Energy Efficiency Voluntary Agreement;

② in July 2005, organize the demonstration enterprises and those enterprises that are willing to conduct technical upgrading to approach the 10 institutions engaged in small and medium scale enterprises' credibility guarantee. Special attention shall be paid to the movement trend of the credibility guarantee fund.

③From September 2005 to July 2006, assist the credibility guarantee institutions to conduct survey on the demonstration enterprises and those enterprises that are willing to conduct technical upgrading and.

④From October 2006 to July 2007, LPIC recommends potential demonstration enterprises to PMO .sign Energy Efficiency Voluntary Agreement. Try to win the support of PTPMC and RCF and improve the enterprises' credibility.

⑥ In April 2008, 1-2 enterprises try to get support of the institutions engaged in small and medium scale enterprises' credibility guarantee.

（7）Conduct on-the-spot meeting to introduce the experiences of those enterprises that sign Energy Efficiency Voluntary Agreement and to promote its extension and publicity

Time: December 2007

Objective: Extend Energy Efficiency Voluntary Agreement

Tasks:

① Print 10 thousand pamphlets on energy efficiency and distribute them to enterprises engaged in casting and deep processing of agricultural and sideline products.

② Organize on-the-spot meeting to introduce the experiences of those enterprises that sign Energy Efficiency Voluntary Agreement

③ Introduce the guarantee institutions for medium and small enterprises and their operation methods.

④ Summon some enterprises and conduct workshops to discuss the possibility and obstacles to implementing Energy Efficiency Voluntary Agreement in enterprises.

5.Follow-up and report of the action plan

According to local realities, LPIC formulates report on the previous year's work every

January and works out *Annual Working Plan of LPIC of Dalian* (Refer to the attachment for detailed form). The report is to be submitted to national PIC secretariat before January 31. The secretariat is to collect all the submitted reports and reports to MOA's GEF office. All the reports are to be evaluated by the office and each action plan shall be revised according to the evaluation results.

Annex 9.3.2.1

Field Survey Report on LPIC Establishment in Dalian

In accordance with the framework and work plan to implement the subcontract entitled "Establishment and Capacity Building of Local Policy Implementation Committees" for the project of "Energy Conservation And Greenhouse Gas Emissions Reduction In Chinese Township And Village Enterprises" Phase II, and to assist the local government in establishing Local Policy Implementation Committee (LPIC) to remove barriers of policy enforcement, product marketing, technology updating and business financing related to the production, marketing and utilization of energy efficient products in local township and village owned foundry enterprises (hereafter TVFEs), a task team, headed by Ms. Wang Guiling, PMO deputy director, paid a 5-day field survey at Jinzhou District, Dalian from February 16-20. Ms. Wang Hui, subcontractor's team leader, industrial experts of the subcontractor and other team members participated in the survey.

Given the changing circumstance in the TVFEs, and to secure a successful survey result, Mr. Wang Xiwu, Senior Adviser of the PIC Secretariat, and DR. Zhang Zhihong, the project CTA, were invited to join the team.

Findings and results are as the following.

1. General background of metal casting TVFEs in Dalian

Situated at the southern extremity of Liaodong Peninsula, Dalian is an important city for ocean shipping, industry, trade and tourism in China. Its GDP reached RMB100.3 billion, the GNP per capita realized 18,429 RMB in 2002. There were a total of 89 metal casting TVFEs in Dalian by the end of 2002, with a total production value of RMB2.75 billion, RMB0.14 billion of taxation and a total of 130,000 employees.

Table 1: Basic Economic Data of Metal Casting TVFEs in Dalian
(Unit: RMB million)

Gross product	Turnover	Value added	Profit & Tax	Tax	Original value of fixed assets	Employees
2750	2350	710	140	52	320	130

2. Developing characteristics in metal casting TVFEs

2.1 Human Resources

As one of the well-developed industrial bases in China, there are an influx of experienced experts and technicians in heavy industry to Dalian. In the early 90's, Dalian's government attached great efforts to the reforming of the city's overall industrial arrangement and structure by removing those enterprises with heavy environmental pollution and poor economic benefits out from the urban areas. Enterprises moved include ones engaged in metal casting and forging and

electroplating. After 16 times of removal, a total of 158 enterprises are relocated. Within them, most are SOEs. Along with the removal and technical renovation, foundry experts and technicians, counting roughly to several thousands, with the removed enterprises have either been engaged by metal casting TVFEs in the suburb or established their own foundries, thus greatly raised the overall technical level in the TVFEs and developing an unique advantage of the TVFEs by engaged with so many experienced experts and technicians introduced from SOEs.

Table 2: Statistics of technicians with metal casting TVFEs in Dalian

Unit: 1 person

	Total Employee	Senior	Middle grade	Junior	Others
	13000	197	1720	2178	8905
Accounting for_ % of the total		1.5%	13.2%	16.8%	68.5%

It is indicated in the tables above that, generally saying, local TVFEs still facing a shortage of qualified employees although they have introduced numbers of people from SOEs. This kind of shortage has caused TVFEs to be with a low technical level, poor capability in soliciting, identifying and introducing energy efficient technology, while there is only___% of technical information are not collected on the market but through personal contacts between individual technicians. In addition, Due to the shortage of qualified technical persons and the backward production equipments, the rejection rate has been roaring up to 15 %. High energy consumption caused high product cost.

Table 3: Metal casting TVFEs' information sources

	Total No. of enterprises	Internet	Association	University /Research institute	Local enterprise	Abroad	Governmental authority	Personal contact	Market
TVE No.	89	0	4	8	32	22	6	15	2

2.2 Market

Dalian is the most developed industrial region in the Northeast China. The gather of many big-sized manufacturing industries, e.g. Dalian Locomotive Plant, Dalian Heavy Machinery Works, Dalian Starter Works and Dalian Dockyard, etc. has formed an approximately 500,000-700,000 tons of market demands for casting.

In the meantime, Dalian, as a key harbor in the Northeast China, is close to Japan and Korea. This geographic advantage attracted many foundries from Japan and Korea to transfer their preliminary casting production, a kind of labor-intensive production, into Dalian where industry is comparably under developing. To a harbor city, the

advantage for ocean shipping of such hulking cargos as metal castings is obvious. Traders from Japan and Korea come to Dalian to look for local foundries. They provide local metal casting TVFEs with latest technology free of charge to help them to produce qualified products. According to the statistics that castings exported to Japan and Korea reaches 400,000 tons every year. Almost all the international market channels of the TVFEs' products are controlled by foreign businessmen and local/international companies, and all the castings produced by the TVFEs are of low and middle grade with low export prices. In the meantime trading me, their capacity of risk withstanding is very poor. In addition, due to lack of accordant standards and price coordination system for casting export, TVFEs have to fight for foreign orders through out-of-order competitions with each other thus severely disturbed the market order and causing the price of their export depreciated. This also, to some extent, ruined the business reputations and hurt the willingness of the TVFEs in particular in updating their production process and equipment thereby raising the energy efficiency and improving the environment protection in their production. In this connection, it has become an essential necessity for TVFEs and the local community to periodically coordinate the order distribution and business transactions within the TVFEs and to fix their export prices based on the marker demand thereby to secure the benefits of the TVFEs and the local community.

2.3 Superiority of raw materials resources

Characterized by big in size, heavy in weight and comparably higher energy consumption than other sectors, foundry products are better to be produced at locations where they are near raw materials resources. The distance between Dalian and Benxi Iron & Steel Works and Fushun coal mines is only 350 km. calculating with the normal highway transport fee at RMB2.00-3.00/ton.km, to transport one ton of coke or pig iron from Fushun to Dalian will save transport cost at about RMB200.00 than that from Taiyuan, shanxi Province.

3. Energy consumption and CO_2 emissions reduction in the local TVFEs

Some TVFEs have taken technical renovations voluntarily, e.g. to replace the old cupolas with inductance furnaces and avoid the operation during peak period thereby saving energies and lowering production cost. We found during the survey that, except 7 TVFEs at Jinzhou District and Lushunkou District in Dalian have introduced such advanced production equipments as mid-frequency inductance furnace, resin sand processing line, on-site spectrum, impeller blaster and heat-treatment oven, etc., most of the TVFEs still use out-of-date equipments, e.g. cupola, intermittent sand miser and artificial sand cleaning process. The use of out-of-date production technologies and equipments caused the castings poor dimensional accuracy; the reject rate is as high as 15% of the total output. See Table 4 for the energy consumption in the TVFEs.

Table 4: TVFES' energy consumption in 2002

Unit: 1000 tons, 1 kg

	Total energy consumption	Energy consumption/ton
Coke	549	520
Coal	76	70
Electricity	341001	324
Finished fuel oil	6.52	10
Tons of coal equivalent	734	700

4. Ownership reforming in TVFEs

Ownership of TVFEs in Dalian has been reformed in accordance with the principle of "Cleared ownership, specified responsibility, to have enterprises' management come-away from the direct governmental interference, and scientific management" since 2002. A total of 79 TVFEs have been reformed accordingly at varies levels. The reform optimized resources distribution, facilitated the access to financing market, perfected the mechanism of enterprise's legal person management and internal management, greatly mobilized the initiative of enterprise's owners and employees thereby increased the enterprises' vitality. All the capacity, product quality and the economic benefit have been greatly raised.

In 2002, the ownership-reformed TVFEs were further standardized according to Dalian municipal's principle of "strengthening and enlarging the scale of local TVEs" to realize the separate of management from the ownership thus restructured TVFEs. See Table 5 for the ownership of TVFEs in Dalian

Table 5: The ownership of TVFEs in Dalian

Unit: 1 number, RMB100 million

Ownership	Enterp. No.	Enterp. Capital	Capital Consistence			
			Collective	Individual	Foreign investment	Legal person
Rural collective	5	3.73	2.28	0.33		*1.12*
Company Limited	31	13.65	4.6	5.275	2.04	*1.735*
Joint Venture	8	4.81	1.62	2.21	0.27	*0.71*
Partnership	12	0.987		0.987		
Sole investment	23	4.005		2.425	1.58	

Total	*79*	*27.182*	*8.5*	*11.227*	*3.89*	*3.565*

5. Policies in relevant to environmental protection

As a heavy industrial city, the environmental development of Dalian has followed a concept of "not pursue to be the biggest in scale, but to be the best" since 1990's. It was awarded "The Top 500 Global Environmental City" and is implementing a program entitled "Blue Sky, clean sea and green landscape".

Under the currently effective environmental legislation system, policies related to environment protection in China include 8 subsystems, e.g. "Environmental impact assessment system of Civil engineering project", "Three simultaneous principles applied on civil engineering project", "Regulations on charge of waste discharge ", "The comprehensive quantity examining system of urban environment renovation", "Targeted responsibility system on environmental protection", "Environmental pollution registration & application system and license system", "Centralized control system on Environmental pollution" and "System of a dealership of governmental authority to timely treat pollutants and harmful waste".

The policies closely related to TVFEs' operation include "Environmental impact assessment system of Civil engineering project", "Three simultaneous principles applied on civil engineering project", "Regulations on charge of waste discharge ", "Environmental pollution registration & application system and license system" and "System of a dealership of governmental authority to timely treat pollutants and harmful waste". These systems are also recognized as "The five fundamental systems" that representing a concept of systematic control to systematically control the new and original pollution sources respectively. The "Environmental impact assessment" is of an in-advance control measure, the "Three simultaneous principles" is of pre-production control measures, the "System of a dealership of governmental authority to timely treat pollutants and harmful waste" is of a measure for original pollution control, "Environmental pollution registration & application system and license system" is of after-production control measures, while the "Regulations on charge of waste discharge " is also an after-production control measure that can be implemented integratively with the standards of pollutant/emission density control.

The State Environmental Protection Agency (SEPA) issued a decree entitled "Regulations on the charge and use of pollutants/wastes discharge fees" on July 1, 2003. It is defined, based on varies pollution elements, in the regulation that, instead of setting up charging rates of waste/pollutant discharging fees, any discharge of waste/pollutant shall be charged while the amount changing should be decided

according the quantity of the discharge. And it could be further punished in case the discharge exceeds the standards. In accordance with the revised "Regulation of water pollution control", methods to charge pollutant/waste discharge fees is changed from charging by discharges that exceed the standards to charging by both the abovementioned one and by whenever waste/pollutant is discharged in the same time. Furthermore, it is also stressed in the regulation that the charge and use of the discharging fees should be controlled by different governmental authorities, i.e. the collection of waste/pollutant discharge fees shall be brought into the financial budget under the item of a specially established fund for environmental protection that shall be strictly audited and monitored. It is further stipulated that the fees collected shall not be used for any other purpose except for the prevention and control of key pollution sources, the prevention and control of regional environmental pollution, the development, pilot and dissemination of new technology and process, as well as subsidies or investment to environmental protection projects of the State Council. It is also clearly defined that expenses needed by authorities regarding environmental protection shall be provided by government at the same level.

By now, details of standards, usage and management and derating in relevant to the collection of waste/pollutant discharge fees, and quantity limitation of the discharge are yet to be released. In this connection, the original ones are still in effective. Discharging fees are mainly collected to flyash that exceeding the discharge quantity quota, while methods for examining discharged quantity include balancing method between raw materials consumed and output and the monitoring method. In order to control the air pollution in Dalian, the local government request that all foundries in Dalian must apply dust collection devices in their production thereby reducing the air pollution. The currently rate for SO_2 discharge is RMB0.20/kg.

After the release of "The promotion code of clean production", Dalian Environmental Protection Agency scheduled that 60% of key industrial enterprises in Dalian should meet the requirement of clean production within the 5^{th} 10-year national plan, established a fund dedicated to the pilot of clean production, and provided RMB100,000 to the selected pilot enterprise as the start capital free of charge.

6. Policies in relevant to the sector

6.1 Abatement and drawback of value added tax in TVFEs

It is stipulated in a decree, which is issued by the Ministry of Finance and the State Revenue entitled "Notice on the abatement and drawback of castings and forgings" (FR No.2002-141), that the value added tax applied on castings and forgings produced for the commercial purpose should be imposed first in accordance with the relevant regulation and then drawn 35% back from the amount of tax paid.

The amount drawn back should be used for the development of new foundry products.

Up to now, there are 4 TVFEs have been listed in the 144 enterprises that enjoying the treatment.

6.2 Funds dedicated to support the development of TVEs in DAlian

In July 2003, Dalian Finance Bureau and TVE Bureau jointly issued a decree to arrange from the governmental budget RMB1.5 million each year to support technical renovation of the key TVEs within the period of 2003-2005. It is mainly used for one year interest subsidy to the development of production capacity and technical renovation in TVEs.

annual turnover, annual export value (foreign currency earned), employment and taxation as well. The application to the fund is scheduled by every June 30.

6.3 SMEs' credit guarantee system

How to access to financing market is really an outstanding issue for the local TVFEs. In 2002, loans provided to the 750,000 TVEs only accounted for 2.1% of the total amount provided by financing institutes in Dalian, while loans provided by financing institutes only accounted for 13.1% of the total fixed assets investment made by the TVEs. Comparing with the industrial value appreciation contributed by TVES, which accounts for 60% of Dalian's total, this is quite inappropriate.

By the end of 2002, Dalain government established an financing office, which is brought into the government's professional system, and the SME's credit guarantee system.

The guarantee system developed very fast in 2003. It provided SMEs with 98 guarantees during the period of January – June 2003 totally RMB0.45 billion accounting for 92.5% and 65.4% of the total 3 years' amount under the above mentioned items thus easing the financing difficulties faced by TVEs at a certain extent.

By now, the number of credit guarantee agencies has increased from 5 to 10 with a total registration capital of 0.879 billion that is 42.5% more than that of the 3 years' total from 2000 t o2003. Besides of the investment made by the government, the business has also absorbed investments from foreign investors and entrepreneurs, in particular from nongovernmental sectors. Within the 10 agencies, 6 are of nongovernmental ones. Their registration capital has reached RMB0.2 billion. Due to the existence of obstacles in relevant to the cooperation between the agencies and banks, policy/taxation support, self-discipline of the business and policy guidance, the

development of the guarantee system is still lagging. Its business covering scope is not large enough, and access to financing market for TVEs is still difficult.

7. A brief introduction to the pilot TVFE

Located at Huajiatun Town, Jinhua District, Dalian, the Dalian Jinmei Cast Iron Pipe Co. Ltd., one of the selected pilot TVFEs of the project, was established in 1978 and covers an area of 50,000 sq.m with a total 120 employees, RMB120 million of fixed assets. It was awarded as an enterprise that "Abiding by contract and paying great attention to the business reputation". In 1998, the company passed ISO 9002 quality control certification. Its products include over 1500 specs of ductile iron castings, e.g. tees, cross joints, reducers and joints with varies connecting angles in 20 categories, and ductile iron pipes sizing from DN100 to DN2600 mm in accordance with ISO2531. Other new products include marine type valves made of cast steel, stainless steel, cast iron, ductile iron and bronze, etc. See Table 6 for details of energy consumption in the enterprise.

Table 6: Energy consumption in Jinmei Cast Iron Pipe Co. Ltd.

Type of energy	Original Energy Consumption	Equivalent factor	Consumption (tce)	CO_2 emissions (t- CO_2)
Coal (t)	72	0.7143	51.4	128
Coke(t)	509	0.9714	494	1,568
Electricity (kWh)	42300	0.383×10^{-3}	16.2	40
Total			561.6	1,736
Reject rate (%)			7~8	
Output (t)			4,496	
Unit energy consumption (tce/t)			0.125	

The planned technical renovation project in the pilot include:

- To replace the old cupola process with a dual smelting process with a cupola and an electric furnace thereby applying the advantages of the two furnaces, e.g. high smelting efficiency of the cupola and the high iron smelting capacity and the convenience to control chemical components in the smelted metal in an electric furnace.
- To introduce a computerized managing system to have the enterprise being operated more efficiently thereby raising its energy efficiency in the production.

8. The establishment of LPIC in Dalian

The establishment of Dalian LPIC was formally confirmed by Dalian TVE Bureau through the issue of a notice entitled "Notice on the establishment of Dalian LPIC" (D/TVE No. 2003-31), in which it was stipulated that the LPIC is consisted of local authorities of Dalian TVE Bureau, Dalian Environmental Protection Agency, Dalian Science and Technology Bureau, Dalian Financing Office and local policy experts.

Given the great effort paid on the local development and the strong awareness in servicing TVEs, Dalian TVE Bureau enjoys a significant reputation in local TVEs, in particular Mr. Yuan, the Deputy General Director of the Bureau, who is very capable to his job, and was the president of a large-sized SOE thus making him to be familiar with business management. In addition, with a PHD degree in economics, he is rarely seen as a TVE bureau head all over the country.

Dalian Financing Office was specially invited to join the establishment of the LPIC. The office is affiliated to Dalian municipality, and in charge of the coordination between financing departments of each governmental authorities. To be a member of the LPIC, the office will play a significant role in coordinating the LPIC's business between departments of the governmental authorities.

9. Recommendations

9.1 To establish TVFE Association

The TVFE Association could be established based on a survey carried out by the LPIC on the current situation of TVFEs in Dalian. Objectives of the association should include providing coordination between the local TVFEs and organizing TVFEs to carry out self-discipline in their business operation thereby overcoming the phenomenon of our-or-order competition with each other and short of self-discipline on their product price making.

9.2 To organize trainings

To invite experts from local and abroad to deliver trainings thus building up the capacity of TVFEs in soliciting and identifying information on energy efficiency and new technology thereby raising their technical level, lowering the reject rate and product cost and reducing energy consumption.

9.3 To publicize Dalian TVFEs and market their product abroad

To organize and invite foreign trade companies come to visit Dalian TVFEs, and to establish a web-page dedicated to publicize Dalian TVFEs as soon as the website of Dalian TVRE Bureau is constructed.

9.4 To full use of varies governmental funds

- To full use varies governmental funds and access to financing market.
- To assist TVFEs in exploring varies access to financing market.
- While introducing non-governmental funds and foreign investments, to stress on supporting TVFEs through the SME credit guarantee system. In the meantime, to assist them, through the PIC, in applying loans from RCF,.

Agenda of the survey in Dalian TVFEs
February 16-20, 2004

Date	Topics	Contents	Venue	Participants
. 16	Meeting with Dalian TVE Bureau	Confirm the agenda and hear introduction on local TVEs/TVFEs	Hotel	PMO, S.C., industrial expert, policy expert, LPIC
17	Meeting with the LPIC members	1. The enforcement of currently effective national/local policies related to energy efficiency 2. Methods, projects and plans of the local authorities in relevant to energy efficiency in TVFEs 3. Willingness of parties concerned to participate in the project and potential support to the project 4. Discuss and finalize draft LPIC statute	Hotel	PMO, S.C., industrial expert, local policy expert and LPIC
18	Meeting with local TVFEs	1. Situation of TVFEs' ownership and operation 2. Willingness and adoption of energy efficient technology and problems faced 3. Suggestions and requirements from TVFEs to the local authorities 4. Discussion and finalization of the draft action plan	Hotel	PMO, S.C., industrial expert, local policy expert and local entrepreneurs
19	On-site survey at the pilot	1.Survey at the pilot 2. Finalize a framework of the technical renovation at the pilot 3. Deliberate articles of the draft VA	The pilot TVFE	PMO, S.C., industrial expert, LPIC, local policy expert and entrepreneurs of the pilot
19	Deliberate the VA	Deliberate articles of the draft VA	Hotel	
20	Visit the Environmental Protection Bureau, Science and Technology Bureau and Dalian Foundry Association and the Financing Office	Carry out continually investigations and collect local policies and regulations concerned	Dalian Environmental Protection Bureau, Science and Technology Bureau, Foundry Association, Financing Office	PMO, S.C., industrial expert

Annex 9.3.3

Energy Efficiency Voluntary Agreement

BETWEEN

Dalian Township and Village Enterprise Bureau, Dalian City, Liaoning Province

(Hereinafter referred to the TVE Bureau)

AND

Dalian Jinmei Cast Pipe Co. Ltd. Dalian City, Liaoning 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. 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 20%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 25%.

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 The Demonstration Enterprise shall establish a concrete Energy Conservation Plan, which shall be reviewed and approved by the TVE Bureau, 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 TVE Bureau shall take the Demonstration Enterprise as a key supporting enterprise and create conditions to support the energy conservation project for the Demonstration Enterprise. 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 TVE Bureau shall 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 TVE Bureau 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 TVE Bureau 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 TVE Bureau 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 TVE Bureau 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.

Dalian Township and Village Enterprise Bureau, Dalian City, Liaoning Province (seal)	Dalian Jinmei Cast Pipe Co. Ltd. Dalian City, Liaoning Province (seal)
Authorized representative	Authorized representative
Date:	Date:

本协议自签订之日起生效。2008 年 12 月 31 日终止。协议中未尽事宜，须经双方共同协商，作出补充规定。补充规定与本协议具有同等效力。

大连市乡镇企业局

（盖章）

授权代表：

日期：2004年4月26日

大连金煤铸管有限公司

（盖章）

授权代表：

日期：2004年4月26日

Appendix:

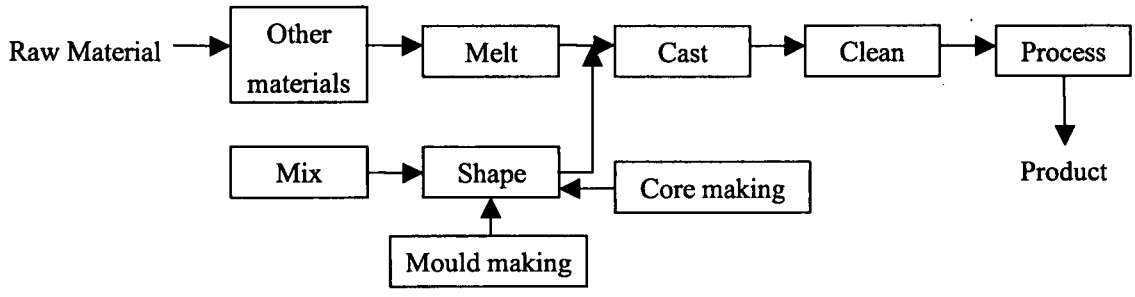
Dalian Jinmei Cast Pipe Co. Ltd.

Energy Conservation Plan

2 Brief Introduction of the Enterprise

The main products of the Demonstration Enterprise are ductile cast iron pipes, including tees, bends and different diameter tees with over 20 series and 1,500 specifications. The Demonstration Enterprise developed new cast steel and precision cast products, including valves for ships of cast steel, stainless steel, cast iron, ductile cast iron, and bronze.

The Technical Process is:



3 Energy Consumption of the Enterprises

Energy Consumption in 2002

Type of Energy	Consumption Quantity	Coefficient	In tce	CO_2 Emission ($t\text{-}CO_2$)
Coal (t)	72	0.7143	51.4	128
Coke (t)	509	0.9714	494	1,568
Electricity (kWh)	42300	0.383×10^{-3}	16.2	40
Total			561.6	1,736
Waste Ratio (%)			7~8	
Production Quantity (t)			4,496	
Energy Consumption per Unit Product (tce/t)			0.125	

4 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 (or production value) by 20%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 25%.

5 Measures for Energy Conservation

5.1 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 2%.
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.	

5.2 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	Enhance the pre-treatment of raw materials, and select qualified coke, metal materials, solvents.	
8	Prolong the time of consecutive operation of the cupola	
9	Use electric motor with speed and frequency modulation	

5.3 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	Adopt combination of cupola and electric stove to replace the existing cupola, in order to fully utilize the advantage of both of the cupola with high efficiency of iron melting and the electric stove with high efficiency of iron liquid heating and easy control of chemical components.	112	280	2004/6-2004/12

6 Expected Output

Energy Conservation Measures	Expected Energy Conservation (tce/a)	CO_2 Emission Reduction (t/a)
Energy Management & common measures	28	70
Energy Conservation & Technical innovation	112	280
Total	140	350

Basic Information of the Demonstration Enterprise

Name: Dalian Jinmei Cast Pipe Co. Ltd.							
Address: Shengli Village, Huajiatun Town, Jinzhou District, Dalian						Zip: 116112	
Ownership: Limited Company						Established in: 1978	
Contact: YU Deyan				Tel: 0411-7209628		Fax: 0411-7209555	
Information on Enterprises Quality							
Honors	Types	Name of Honors		Issued by		Date	
Certifications	Type	Name		Validation date		Products	
	Quality Control System Certification	ISO9001:2000		2005		Valve, Pipe	
Year		2000		2001		2002	
Product	Product type	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)
	Pipe	2496	2080	3233	2650	3096	2580
	Jointing flange	2592	2160	672	546	760	618
Asset value (10k RMB)							
Work force (person)		192		103		110	
Area (m^2)		60,000		60,000		60,000	
Energy Consumption							
Year		2000		2001		2002	
Energy Consumption		Quantity	Coefficient	Quantity	Coefficient	Quantity	Coefficient
Coal (t)		68	0.7143	75	0.7143	72	0.7143
Coke (t)		446	0.9714	558	0.9714	509	0.9714
Fuel Oil (t)							
Coal Gas (m^3)							
Natural Gas (m^3)							
Electricity (10k kWh)		4.36	0.383	4.11	0.383	4.23	0.383
Heat (10k kCal)							
Steam (t)							
Compressed Air (m^3)			-		-		-

Annex 9. 4. 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 9.4.2.1

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

Annex 9.4.3

Energy Efficiency Voluntary Agreement

(Draft)

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 9.5.1

Statute of Jiangning Policy Implementation Committee

Introduction

Clause 1 Nature

Jiangning Policy Implementation Committee (hereinafter referred to as Jiangning LPIC) is an institution led by the Jiangning district government, which is established to help metal casting TVEs in the district to remove policy barriers in applying energy efficient technologies.

Clause 2 Objective

The objective of Jiangning LPIC is to promote energy efficient technologies in the metal casting 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 Jiangning LPIC

Clause 3 Member organizations

Jiangning LPIC is comprised of representatives from the District Bureau of Small & Medium Enterprises, the District Bureau of Environmental Protection, the District Finance Bureau and the District Bureau of Science and Technology.

Clause 4 Delegates

Jiangning LPIC shall have 4 delegates, who should be directors of the above-mentioned 4 local government authorities.

Clause 5 Term of service

Jiangning 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 deputy district governor in charge of industries shall take the post of Director, and the director of the District Bureau of SME shall take the post of Deputy Director. The Deputy Director can act as Director in his absence. In addition to the normal duties and obligations of a member of Jiangning LPIC, the Director (or acting Director) chairs meetings of Jiangning LPIC, signs Minutes and formal correspondence of Jiangning LPIC.

Clause 7 LPIC Office

The Jiangning LPIC Office is responsible for the administrative routine activities of Jiangning 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 Zhushan Road, Dongshan Town, Jiangning District, Nanjing City.

Clause 8 Office staff

The office staff includes experts in local policy issues, the director of the SME Office, and the Deputy Director of Jiangning LPIC.

Functions of Jiangning LPIC

Clause 9 The major responsibility of Jiangning 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 metal casting industry of the district, and to remove policy barriers encountered in the process.

1. Jiangning 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. Jiangning LPIC will promote Energy Efficiency Voluntary Agreement (VA) to be signed by and between the local government and TVEs.
3. Jiangning LPIC will regularly provide TVEs with information about updated energy efficient technologies and related policies both inside and outside China.
4. Jiangning LPIC will promote in the district better enforcement of existing national policies for technical upgrading, energy conservation and environmental protection.
5. Jiangning 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. Jiangning 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 Bureau of SME assumes the responsibility of organization and coordination activities as well as the administration of all metal casting TVEs in the district.
2. The District Bureau of Science and Technology and the District Finance Bureau are responsible to provide technical support to metal casting TVEs applying energy efficient technology.
3. The District Bureau of Environmental Protection will provide guidance to metal casting TVEs in the aspect of policies and emissions standards, and will conduct environmental evaluation of the TVEs.

Governance and working procedures

Clause 11 Modality of operation

Jiangning LPIC will operate by means of meetings, once half a year. The Director, or the 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. Jiangning LPIC reserves the right for the explanation of this statute.

Annex 9.5.2

Action Plan of the LPIC of Jiangning district, Nanjing 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.

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 casting 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 PMC of Jiangning district has formulated the action plan.

2. Obstacles to Adopt Energy Efficiency Technologies

For Jiangning district's casting industry, the market, policy, technical and financial obstacles to adopt energy efficiency technologies are as follows:

① The property right reform of the welfare casting enterprises is confronted with tax obstacle;

② There is a long way to go for applying for the preferential policy of collecting value-added tax and reimbursing afterwards;

③ The information services for the casting industry are inadequate;

④ The price increase of the raw materials has brought market and financing difficulties for the industry.

3. Objective

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

① The government sign *Energy Efficiency Voluntary Agreement* with

demonstration enterprise.

② To upgrade the energy efficiency technologies and the objective is to decrease per product's energy consumption by 18% (with the data of 2002 as baseline)

③ To establish an effective mechanism and lay sound basis for casting industry's sustainable energy efficiency and GHG emission reduction and popularize *Energy Efficiency Voluntary Agreement*

④ To bring energy efficiency and GHG emission reduction into legal system.

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

① In 2008, compared with the data of 2002 (baseline), the objective is to decrease per product's energy consumption by 20%.

② Extend the demonstration enterprises' voluntary agreement model in casting industry and establish enterprises' self-improving mechanism to promote energy efficiency by adopting a market transformation approach.

To fundamentally improve the legal environment for energy efficiency and GHG emission reduction

4. Implementing Plan

(1) Government signs EE Voluntary Agreement with demonstration enterprises.

Time: July 2003—December 31, 2008

Objective: government signs energy efficiency Voluntary Agreement with demonstration enterprises and the energy efficiency objective is to decrease per product's energy consumption by 18% compared with that of baseline year 2002; and per product's energy consumption decreases by 20% in 2008.

Tasks:

① Make surveys of demonstration enterprises

Energy efficiency technology upgrading plan shall be brought forward by experts according to enterprise's production processes, energy consumption pattern, product varieties, total output plan and new product development plan.

② Consult with enterprises and formulate energy efficiency technology upgrading plans that are to be assessed.

③ Identify barriers to the implementation of the plan.

④ LPIC consult with local government and formulate incentive policy;

⑤ Work out energy efficiency Voluntary Agreement draft together with demonstration enterprises;

⑥ Consult with PLC and RCF and provide technical and financial support;

⑦ Sign Energy Efficiency Voluntary Agreement; (See Energy Efficiency Voluntary Agreement for detailed incentive policies and EE indexes);

⑧ 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;

⑨ Summarize the experiences accumulated by demonstration enterprises and get

ready for extending the experiences in Jiangning district's casting industry.

⑩ Increase the number of demonstration enterprises.

(2) Organize study tours

Time: December 2004

Objectives: To find out Dalian casting industry's market and their technical level.

Organize 5 local casting factories' directors to go to Dalian. They shall visit 10 casting enterprises with the help pf Dalian TVEs' Bureau and study the experiences accumulated by Dalian casting industry in developing external market;

(3) Study tour for welfare enterprises' property rights reform

Time: March 2004

Objectives: To put forward suggestions for implementing preferential tax policies after the property right reform of local welfare enterprises.

Tasks:

Organize LPIC members and local welfare enterprises' directors to go to Suzhou, Wuxi and Changzhou to study the implementation of preferential tax policies among welfare enterprises and put forward suggestions for implementing preferential tax policies after the property right reform of local welfare enterprises.

(4) Information building

Time: February 2004

Objectives: Assist demonstration enterprises to apply to the government for fund for the Information construction of the Technology Development Center that was jointly established by Tsinghua **University and Nanjing Moling casting central factory;**

Tasks:

① Survey and learn the demand for information construction of the Technology Development Center that was jointly established by Tsinghua University and Nanjing Moling casting central factory;

② Write project proposal and relevant reports;

③ Apply for information construction fund through local TVEs' Bureau to Nanjing TVEs' Bureau.

(5) Apply for preferential tax policy

Time: February 2005

Objectives: Apply for preferential tax policy

Tasks:

Organize the casting factories that specialize in castings and forgings production in Jiangning district to apply for the preferential policy of "Collecting valued-added tax and reimbursing afterwards", which was issued by Ministry of Finance and State Tax Administration.

(6) Favorable policies for those enterprises that sign Energy Efficiency Voluntary Agreement

① With the influence of GEF project, try to win technical upgrading fund;
② Guide the enterprises to conduct energy efficiency and GHG emission reduction activities and accelerate the depreciation of those equipment listed in government's clean production catalogue;
③ The cost used for energy auditing and training is to be listed in enterprises' running expenses.
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.

(7) Strengthen publicity of Energy Efficiency Voluntary Agreement and promote the extension ISO14000

Time: July 2006

Objectives: Publicity of Energy Efficiency Voluntary Agreement and promote the extension ISO14000

Tasks:

① Organize on-the-spot meeting to introduce the typical enterprises that conduct energy efficiency and introduce their experiences.
② Publicize and carry out the environment protection management standards listed in ISO14000 and improve the enterprises' management level and their awareness in energy efficiency technological upgrading;
③ LPIC sends notices on promoting Energy Efficiency Voluntary Agreement among casting enterprises in Jiangning district.
④ LPIC recommends potential demonstration enterprises to PMO.

(8) Reward system

① Initiate public appraisal for advanced or modern enterprises.
② Commend and award those groups or individuals that contribute greatly to

research, development and extension of energy efficiency technologies.

③ PIC, LPIC and PMO grant to local demonstration enterprises award brand;

④ PIC and PMO issue certificates to local major participants and proper awarded shall be granted to them.

5.Follow-up and report of the action plan

According to local realities, LPIC formulates report on the previous year's work every January and works out *Annual Working Plan of LPIC of Jiangning County, Naijing Province* (Refer to the attachment for detailed form). The report is to be submitted to national PIC secretariat before January 31. The secretariat is to collect all the submitted reports and reports to MOA's GEF office. All the reports are to be evaluated by the office and each action plan shall be revised according to the evaluation results.

Annex 9.5.2.1

Report on Establishing LPIC in

Jiangning District, Nanjing City, Jiangsu 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 their production and marketing of Jiangning Casting Industry, to help them overcome 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, with workshops, on-the-spot investigation and questionnaire answering activities employed, led by Ms. Wang Guiling, PMO deputy director, consisting of Ms. Wang Hui, subcontractor manager, subcontractor experts and technical professionals, went to Jiangning district, Jiangsu Province and conducted a five-day tour from November 22 to 26, 2003 (See attachment for detailed activities and name list of the participants).

1. Brief Introduction of Jiangning Casting Industry

Jiangning district of Nanjing city covers an area of 1567 km^2 and has a population of 750 thousand.

Table 1: General Information of Casting Industry in Jiangning District

	Unit	Casting industry in 2002	TVEs in 2002	Percentage of casting industry to TVEs in 2002 (%)
Number of enterprises		18	17357	0.1
Total output value	10,000 Yuan	47167	3644144	1.3
Initial fixed capital value (million Yuan)	10,000 Yuan	8447	1047355	0.8
Staff employed	Person	1943	236267	0.8

In 1980s, the casting industry in Nanjing had developed rapidly in the context of vigorous TVEs development. There had been 364 casting enterprises and the total

output reached 460 thousand tons. In 1995, there was 280 casting enterprises and total output value reached 350 thousand tons. In Jiangning district alone, there was more than 120 casting enterprises and total production accounted for 18% of TVEs' total output value. With increasingly competitive market and continually upgraded technologies, especially with increased public awareness and Jiangning district's planning requirement of building ecological and garden-like district, the casting industry had gradually shrunk. The percentage of casting to total TVEs' output had dropped from 18% to 1.3% and the number of enterprises dropped from 120 to 18.

Table 2: Cast Varieties Produced by Jiangning Casting Industry

Unit: 10,000 tons

		Total output	Iron cast			Cast steel
			Grey iron cast	Nodular graphite cast iron	Subtotal	
2001	Output	5.5	4.85	0.4	5.25	0.25
	Percentage %	100	88.2	7.3	95.5	4.5
2002	Output	6.15	5.35	0.5	5.85	0.3
	Percentage %	100	87.0	8.1	95.1	4.9

In 2002, the main product manufactured by the casting industry in Jiangning district of Nanjing city is grey iron cast, accounting for 87% of the total output.

Table 3 Energy Consumption and CO_2 emission of Jiangning Casting Industry

	Unit / Year	2001	2002
Output	10,000 tons	5.5	6.15
Energy consumption per unit	Tons of coal equivalent per ton	0.638	0.630
Total energy consumption	10,000 tons of coal equivalent	3.51	3.87
Electricity	10,000 kwh	1300	1403
Coke	10,000 tons	4	4.5
Rate of rejected products	%	15	15
CO_2 emission	10,000 tons	8.77	9.69

In Jiangning district of Nanjing city in 2002, the total energy consumed was 38.7 thousand tons of coal equivalents. The unit energy consumption in casting industry was 0.630 tons of coal equivalent per ton of cast; CO2 emission was 96.9thousand tons and the energy cost accounts for 25-30% of total cost.

2. Brief Introduction of the Pilot Enterprise

Nanjing Moling casting central factory is the pilot enterprise selected by the project. It was founded in August 1987. As a collectively township owned enterprise, it has specialized in producing sophisticated cast and aluminum alloy hardware of different sizes and the annual production has reached 13 thousand tons. In 1995, the pilot enterprise organized "Moling Machinery Manufacturing Factory of Shanghai Diesel Stock Company" together with Shanghai Diesel Engine Stock Company. The leading products include diesel engine frame cast, aluminum alloy inlet manifolds, and inlet bend and inlet connection for motor engineers. In 2002, the factory passed ISO9001: 2000 certification. In 1998, Technology Development Center was jointly established with Tsinghua University and the factory also owns its own information center. The products manufactured by the factory has won the title of "Quality Certificate" issued by Shanghai Municipality's Electromechanical Industry Administration, "Certificate of Qualified Measurement" issued by Nanjing Technical Supervisor Bureau, "Overall Quality Management" issued by Ministry of Agriculture, Nanjing AAA-level credibility enterprise, Nanjing Star Enterprise, Nanjing Best Economic Efficiency Enterprise and 500 Best National Welfare Enterprises.

In 1998, the factory invested 5 million Yuan in sand treatment department's technical upgrading and the upgrading finished in June 1999.

In the second phase of the project, cold-box method shall be utilized to rebuild another annealing furnace. It is estimated that 10 million Yuan shall be invested for product quality improvement, energy efficiency and CO2 emission reduction.

Table 4: Comparison before and after upgrading

	Unit	Before upgrading	After upgrading	Comparison
Total cast output	Ton	13245	20000	↑ 51%
Unit energy consumption	Ton of coal equivalent/ ton	0.617	0.52	↓ 16%
Total energy consumption	Ton of coal equivalent	8166	10482	↑ 28% per ton of cast
Unit energy cost per ton of cast	Yuan/ton	715.4	597	↓ 16.5%

Rejection ratio	%	15	8	↓ 47%
CO_2 emission per ton of cast	Ton/ ton of cast	1.54	1.3	↓ 16%
Total CO_2 emission	Ton	20415	26205	↑ 28%

3. Casting Industry Supervision and LPIC Establishment

In Jiangning district of Nanjing city, Medium and Small Scale Enterprises Bureau supervises TVEs. With further economic reform and the reconstructing of government missions, the local Government Affair Service Center was established. Members from Different government departments work in the center to provide service for enterprises. It has been figuratively known as government supermarket.

Nanjing Moling casting central factory, the pilot enterprise selected by the project, is willing to conduct energy efficiency technical upgrading. Supported by Jiangning district government, local Medium and Small Scale Enterprises Bureau has coordinated Environment Protection Bureau, Science and Technology Bureau, Bureau of Finance to establish LPIC in Jiangning district of Nanjing city in order to help local casting industry to remove the market, policy, technology and financing obstacles to energy efficiency technical upgrading.

Local Medium and Small Scale Enterprises Bureau have integrated LPIC's work into government supermarket and this has enabled LPIC to conduct work more efficiently and this makes it possible for LPIC to be integrated into government body.

4. Property Right of Jiangning Casting Industry

Among the 18 casting factories in Jiangning district, there are 14 privately owned ones. Another two cooperative shares factory are founded on the basis of cooperation. The other two are township owned welfare enterprises.

At the early phase of property right reform, most casting factories were collectively owned. With reform further on, in 1998, most TVEs' property right was changed into cooperative shares system. In Jiangning district, 14 out of 18 local casting factories were radically reformed into privately owned enterprises. The property right status of the other four enterprises remains indefinite and the pilot enterprise is one of them.

During the project first phase, it has been proposed that former property right status has restrained TVEs' energy efficiency technology upgrading. The launch of the second phase project has promoted the property right reform of the pilot enterprise. By now, the property right reform plan of the pilot enterprise has been worked out.

The State Land Use Certificate is in the process of transaction and it is estimated that the reform shall be completed at the end of 2003. The property right reform of the other three enterprises has also been planned.

In the process of property right reform of the pilot enterprise, a tax policy obstacle has occurred, that is whether the welfare enterprise can still enjoy relevant preferential tax policy after property right reform. Nanjing Moling casting central factory is the township welfare enterprise founded in 1987. According to *Notice on circulation tax Collection in Welfare Enterprise* that was issued by State Tax Administration in 1994, the welfare enterprise includes "enterprises established by civil administration departments, streets and towns, not including enterprise invested by foreign businessmen".

According to the Notice, the preferential policy for welfare enterprises are as follows: for those welfare enterprises that the disabled employees accounted for not less that 50% of the total productive staff, the valued-added tax shall be collected at first. After the tax administration's examination and approval, the paid tax shall be reimbursed. The policy has been carried out since January 1, 1994 and effectiveness for two years. In 1996 and 2000, Ministry of Finance and State Tax Affairs Administration reconfirmed its effectiveness and it has been effective till now. Accordingly, one condition of enjoying preferential tax policy is that the enterprise are invested and established by civil administrations, streets and township governments. Actually, limited liability companies and private companies account for a major part of welfare enterprises. In order to enjoy preferential tax policies, some enterprises are licensed as welfare enterprises. After reformed into private owned enterprises, they shall not be qualified to enjoy the preferential policies. The negative effect of the change is that the enterprises shall fire the disabled employees in order to get maximum profit. It shall be hard for the unemployed disabled staff to find other job and this is contrary to the original intention of developing the enterprise with property right reform. According to the manager of the pilot factory, in other regions such as Suzhou, Wuxi and Changzhou, after reformed into private owned enterprises, these factories still enjoys the preferential tax policy.

5. Tax Policy for Casting Industry in Jiangning District

Since 1994, the preferential policy, levying value-added tax and reimbursing it afterwards, has been implemented in some factories engaged in casting and forging production in five phases. According to the *Notice on levying value-added tax on castings and forgings and reimbursing it afterwards*, which was issued by Ministry of Finance and State Tax Administration in 2002, the value-added tax levied on commercial castings and forgings used for producing machinery, shall be collected according to relevant laws and regulations and 35% of the amount of tax paid shall be reimbursed. The reimbursed fund shall be used for the research and development of casting and forging industry.

According to the above mentioned notice, after submitting application, examination and approve, there are 5 enterprises now enjoy the preferential tax policy. Although Nanjing Casting Association has organized the application activities within the whole region, none of the producers from Jiangning district has applied for the preferential policy. Two factories including the pilot enterprise have not participated in applying because they had enjoyed preferential policies as welfare enterprises. The other 16 enterprises regard themselves as small-scaled and technically low-leveled and pay little attention to apply for preferential policies.

6. Environment Protection Policy

Nanjing city is well known for its long history and attaches great importance to environment protection. Jiangning Economic and Technical District has passed ISO14000 certification and this is quite rare in county-level districts. It is a major measure for the local government to scientifically manage environment under the current environment policy and legal framework.

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. These five systems are quite basic to control both old and new pollution sources and embody the philosophy of systematic control. Environment impact assessment is control ahead of time; "Three Qualifications" is pre-production control. The time-limited treatment is a way to control old pollution sources. Pollution permit is post-production control. Payment for pollution is to combine post-production control with concentration standard control.

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, were 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.
According to the newly issued *Stipulations on Levying and Using Pollution Fees* and the *Implementing Method* issued by Hubei Province, Xinjin County levies pollution fees for SO_2 emission according to the principle of lawfully levying the due amount. Formerly, based on total coal consumption and its S content and the unit fee of 15 Yuan per ton of coal, the total fee paid for SO_2 emission can be calculated. Now the fee is paid according to the actual SO_2 emission amount tested by local environment protection administration. The unit fee standard for SO_2 emission is 0.2 Yuan/kg in 2003, 0.4 Yuan/kg in 2004 and 0.6 Yuan/kg in 2005.

In Jiangning district, environmental impact assessment and "Three Qualifications" policy has to be obeyed when newly building, expanding or rebuilding enterprises and these two policies have been satisfactorily carried out.

7. Technology Status

1) Technologies presently adopted

Among the production lines of the 18 casting factories in Jiangning District, 10 is designed by professional institutions, 8 are designed by the factories themselves and there are 8 factories with backward production processes.

Table 5: Production processes of the casting industry in Jiangning district

	Number of enterprises	Production processes		
		Molding	Smelting equipment	Output ton/year
Backward level	8	Hand molding	Self-made cold wind cupola furnace	1000
Average level	8	Machine molding Mechanized sand treatment	Hot wind cupola furnace	5000
Advanced level	2	Mechanization and	Complete measurement equipment and monitoring	5000

		semi-automated sand treatment	system, computerized mix hot wind cupola furnace, smelt with both cupola furnace and electrical furnace	

2) Information Sources

Table 6: Technical Information Sources of Jiangning Casting Industry

	Number of enterprises
Total number	18
Internet	5
Association	2
Colleges and universities and scientific institutes	5
Domestic enterprises	2
Foreign	1
Government departments	2
Friends	2
Market	8

According to the table 6, the main information sources of Jiangning casting industry include technical market, colleges and universities, scientific institutions and Internet.

According to the table below, the percentage of the staff with junior or senior high school education to the whole staff employed by local casting industry is 77.2%. The staff with preliminary technical title accounts for 3.9% of the total staff. The educational accomplishment of the staff is vital to the adoption of energy efficiency technologies.

Table 7: Technical Personnel Structure in Jiangning Casting Industry

	Total number of staff Employed	**High professional title**	**Medium professional title**	**Preliminary professional title**	**Junior or senior high school**	**Other**

Persons	1943	5	20	50	1500	368
%		0.3	1.0	2.6	77.2	18.9

The pilot enterprise has participated in the first phase of the project and is closely associated with casting experts from Tsinghua University. In 1999, approved by Jiangning district Science and Technology Bureau, Technology Development Center of Tsinghua University and Nanjing Moling casting central factory was established. Local Science and Technology Bureau annually to support its capacity building and to purchase equipment have invested 100 thousand Yuan in the center. The center has been engaged in training casting professional, obtaining relevant industrial information and promoting the pilot enterprises' technical innovation.

7. Market situations in Jiangning district

The products of Jiangning casting industry are mainly sold in domestic market, especially in the markets of Jiangsu province, Zhejiang Province, Shanghai municipality and Anhui province. As the areas mentioned are highly developed areas in east China, there is a great demand of the casting products and the requirement for the products' quality is also high.

Table 8: Raw materials' Price Increase in Casting Industry

Unit: Yuan/ ton

Raw materials	Price in September 2002	Price in October 2003	Increase range %
Coke	600	1400	133
Pig iron	1500	2350	56.7
Waste steel	1100	1800	63.6

The biggest problem the casting industry faced with is that the price of the raw materials has increased and this caused increased production cost. Compared with that of October 2002, the coke price has increased by 133%, the pig iron price has increased by 56.7% and waste steel by 63.6%. However, the contracted price of the casting products can not be changed according to the market changes, so the casting industry has to undertake the losses caused by the price increase of the raw materials. The products manufactured by Jiangning district casting industry are mainly sold to domestic users and this has restricted the increase of the product price and there is little margin for price increase.

Take an example of the pilot enterprise, it has to increase 15.9 million Yuan to offset the effect caused by the raw material price increase, but it can only get 1.5 million Yuan from the users as the compensation for the raw material price increase.

Table 9: Increased Expenses Caused by Raw Materials' Price Increase

Raw materials	Price increase (Yuan/ton)	Annual amount consumed (ton)	Annual increased expenses (10,000 Yuan)
Coke	800	4000	320
Pig iron	850	10,000	850
Waste steel	700	6,000	420
Expected total increased expenses			1590

8. Financial Status of Jiangning Casting Industry

The fact that the raw materials price has increased and the price of the casting industry products remained unchanged has made the profits of the casting industry dropped or even became negative. This has seriously damaged the enterprises financial credibility. Banks no longer grant new loans to the enterprise. In applying for bank loan, the enterprises have to provide land, workshop buildings or equipment as mortgage. As the four casting factories are all collectively owned enterprises and welfare enterprises, they do not have land property right and the land can not be used as mortgage so the enterprises have difficulties in financing.

9. Conclusions and Recommendations

Conclusions:

1) As a city well known for its long history, Nanjing has attached great importance to cultural relic and environment protection. The pilot's efforts for energy efficiency, product quality improvement and GHG emission reduction will have significant demonstrative influence on both casting industry and the development of other industries.
2) LPIC has been successfully established in Jiangning district of Nanjing city. The work of LPIC has been integrated into government supermarket by Jiangning district's medium and small Scale Enterprises Bureau. This has laid sound basis for the implementation of the action plan.

Suggestions:

1) Make a study tour to Suzhou, Wuxi and Changzhou to learn the experiences of property right reform in these areas and propose to Jiangning government to refer to the reform practices in these areas and remove the policy obstacles to property right reform.;
2) Organize casting factories to apply for the preferential rule of first levying value-added tax and reimbursing afterwards.
3) Strengthen casting industry information network and try to win government fund for information service.

4) Develop external casting market and remove the market and financing obstacles caused by the increased price of raw material.
5) Organize enterprise to make study tour to casting factories in Dalian.

Annex:

Schedule for Study Tour of Casting Industry in Jiangning District, Nanjing City, Jiangsu Province (Oct 22-26, 2003)

Time	Subject	Activity	Locale	Participants
Oct 22 PM	Working meeting in Jiangning district	Confirm study tour itinerary and other affairs	Hotel	PMO, members of subcontractor expert group, local policy experts and industrial professionals
Nov 23	Workshop with Casting producers of Jiangning 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, members of subcontractor expert group, local policy experts and industrial professionals and directors from Jiangning Casting factories.
Nov 24	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 casting industry; 4. the willingness of the involved stakeholders to participate in project implementation and support	Hotel	PMO, PIC, subcontractor expert group, LPIC representatives from local Medium and Small Scale Enterprises Bureau, Environment Protection bureau and Science and Technology bureau and

		they possibly provide for the project.		local policy experts.
Nov 25 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, local policy experts and directors of pilot enterprises
Nov 25 PM		Discuss the items of Voluntary Agreement	Hotel	
Nov 26 AM	Visit to Environment Protection Bureau, Science and Technology Bureau	Collect local laws and policies	Environment Protection Bureau, Science and Technology Bureau	PMO, subcontractor expert group and local policy experts
Nov 26 PM	Field Trip	Visit to pilot enterprises, discuss the willingness and obstacles to energy efficiency technology adoption	Casting enterprises	

Annex 9.5.3

Energy Efficiency Voluntary Agreement

BETWEEN

Government of Jiangning District, Nanjing City, Jiangsu Province
(Hereinafter referred to the Government)

AND

Moling Casting Factory, Nanjing, Jiangsu 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. 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 18%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 20%.

2.3 Because the government adopts stricter environmental standard and more energy is consumed, the targets shall be adjusted if the following 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 relative preferential public policies. 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 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, 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 Jiangning County, Nanjing City, Jiangsu Province (seal)

Moling Casting Factory, Nanjing, Jiangsu Province (seal)

Authorized representative	Authorized representative
Date:	Date:

本协议自签订之日起生效。2008 年 12 月 31 日终止。协议中未尽事宜，须经双方共同协商，作出补充规定。补充规定与本协议具有同等效力。

江苏省南京市江宁区人民政府

（盖章）

授权代表：

日期：2004年4月28日

江苏省南京市秣陵铸造总厂

（盖章）

授权代表：

日期：2004年4月28日

Appendix:

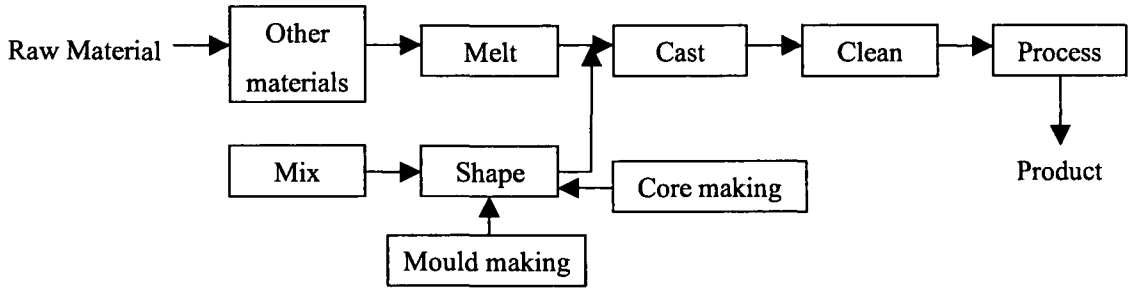
Moling Casting Factory

Energy Conservation Plan

2 Brief Introduction of the Enterprise

The major products of the demonstration company are large, medium, and small complicated thin high-strength casts and aluminum alloy hardware. The dominant products include large, medium, and small casts for 135 and D114 diesel engine, duct alloy for architecture, aluminum alloy hardware for vehicle engine.

The Technical Process is:



3 Energy Consumption of the Enterprises

Energy Consumption in 2002

Type of Energy	Consumption Quantity	Coefficient	In tce	CO_2 Emission (t-CO_2)
Coal (t)	1,798	0.7143	1,284	3,202
Coke (t)	3,740	0.9714	3,633	11,527
Electricity (kWh)	7,120,000	0.383×10^{-3}	2,727	6,798
Oil Product (t)	256	1.4714	377	746
Total			8,021	22,273
Waste Ratio (%)			15	
Production Quantity (t)			13,245	
Energy Consumption per Unit Product (tce/t)			0.606	

4 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 (or production value) by 18%; and by 31st December 2008, achieve the energy conservation target: reduce energy consumption per unit product (or production value) by 20%.

5 Measures for Energy Conservation

5.1 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 1.5%.
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.	

5.2 Common Energy Conservation Measures

	Measures	Effect
1	Use high efficiency lighting products.	Estimate increase energy conservation rate by 2.5%.
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	Enhance the pre-treatment of raw materials, and select qualified coke, metal materials, solvents.	
8	Prolong the time of consecutive operation of the cupola	
9	Use electric motor with speed and frequency modulation	

5.3 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	Build coke storeroom with roof. Calculated on 300 ton of coke every time, the area of the storeroom will be1,000 m2. In rainy seasons, the utilization ratio increases by 10%. Estimated investment is 300,000 RMB yuan.	182	576	2004/6-20 04/12
2	Build static-pressure automatic shaping production line with capacity of 20,000 ton/year.	1276	3181	
	Total	1458	3757	

6 Expected Output

Energy Conservation Measures	Expected Energy Conservation (tce/a)	CO_2 Emission Reduction (t/a)
Energy Management & common measures	160	399
Energy Conservation & Technical innovation	1458	3757
Total	1618	4156

Basic Information of the Demonstration Enterprise

Name: Moling Casting Factory							
Address: Moling Town, Jiangning District, Nanjing, Jiangsu Province						Zip: 211111	
Ownership: Collective						Established in: 1987	
Contact:				Tel: 025-2750950		Fax: 025-2755159	
Information on Enterprises Quality							
Honors	Types	Name of Honors		Issued by		Date	
Certifications	Type	Name		Validation date		Products	
	Quality Control System Certification	ISO9002:94		1996		135 machine body, aluminum alloy hardware	
		ISO9001:2000		2002		All Cast and Hardware	
Year		2000		2001		2002	
Product	Product type	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)	Output (t)	Value (10k RMB)
	Cast iron hardware	5013	2301	5360	2485	12478	5604
	12v machine body	205	175	90	72	767	609
	Pipe (set)	18020	306	15978	225	13664	190
Asset value (10k RMB)		5917		5196		7929	
Work force (person)		382		382		478	
Area (m^2)		76,000		100,000		100,000	
Energy Consumption							
Year		2000		2001		2002	
Energy Consumption		Quantity	Coefficient	Quantity	Coefficient	Quantity	Coefficient
Coal (t)		802	0.7143	975	0.7143	1798	0.7143
Coke (t)		1525	0.9714	1568	0.9714	3740	0.9714

Fuel Oil (t)	147		138		256	
Coal Gas (m^3)						
Natural Gas (m^3)						
Electricity (10k kWh)	246	0.383	255	0.383	712	0.383
Heat (10k kCal)						
Steam (t)						
Compressed Air (m^3)	19390	-	20304	-	45276	-

Annex 9.6.1
The establishment of PIC and LPIC

PIC Secretariat

August 2003

I. Foreword

(2) Project mechanism

- Project support fundamentals

Grant — incremental cost — removal of barriers of policy, technology, marketing and financing

- To establish barrier removing mechanism and enhance capacity of self-sustainable development

I. Foreword

1.Project mechanism

(1) A brief introduction to GEF/UNDP/TVE

"Energy Conservation and Greenhouse Gas Emissions Reduction in Chinese TVEs - Phase II " is a project funded by Global Environment Facility (GEF)

- GEF— Emissions of greenhouse gas and the climate warming, biodiversity, international water areas and ozonosphere damage
- UNDP— Development of the third world, antipoverty , women liberation, energy resources and environmental protection.

I. Foreword

(3) Mechanism establishment to remove the barriers

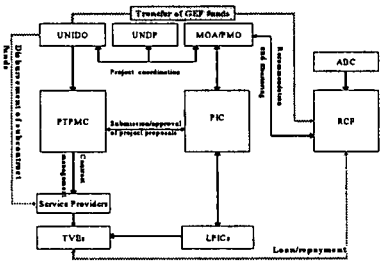
- Policy Implementation Committee: PIC and LPIC
- Production Technology and Product Marketing Consortium (PTPMC)
- Revolving Capital Fund (RCF)

I. Foreword

- Particularities of Chinese TVEs and the four sub-sectors

✓ A significant part in China's economical and social development
✓ Local and global environmental pollution caused
✓ Particularities of the four sub-sectors, i.e. cement, brick making, coking and metal casting

Institutional Arrangement



I. Foreword

(4) Piloting and Replicating

➢ 8 pilot TVEs and Counties

✓ Selection range: within the four sub-sector

✓ Selection criteria

- The production line of the TVE should be at average level or over; and the TVE should be willing and with great potentiality in adopting energy efficient production technology thereby to reduce greenhouse gas emissions
- The TVE should be qualified in business operation with sound financial credit, business reputation and great market potentials.
- With clarified ownership and qualified managing staff;
- With significance of piloting/demonstrating in the local region; while the local government is enthusiastic in and support the project implementation in the region.

II. The establishment of PIC

3. Key activities

- Provided advices on the recruitment of international legal expert, as well as on the establishment of PTPMC and RCF at the early stage
- Compiled reports on the development of Chinese TVEs, review of laws and policies related to the four sub-sectors and rural environmental protection, etc. Together with the international legal expert and PTPMV Secretariat
- Organized a study tour and introduced Voluntary Agreement (VA) from abroad in August 2002

I. Foreword

➢ Success indicators of the project

✓ Technical update done and E.E. goals reached at the 8 pilot TVEs

✓ LPICs established and Work Plan formulated at the 8 pilot TVEs

✓ Pilot counties increased to 20 while pilot TVEs increased to 100

✓ PTPMC and RCF developed sustainably

II. The establishment of PIC

3. Key activities (continued)

- Called PIC annual meeting on August 2002. Issues Approved: PIC Statute and Proposals on the start-up of four pilot TVEs/counties
- Selected through competitive bidding the subcontractor and awarded the subcontract of establishment and capacity building of LPICs
- Took part in activities regarding the establishment of PTPMC and RCF by providing consultation on legal issues thus accelerated the establishment progress
- Currently, preparing PIC annual meeting 2003 and

II. The establishment of PIC

1. Establishment of PIC

- PIC is constituted by representatives from MOA, MOF, SETC, MOST, SEPA AND ABC in March 2001
- PIC Secretariat

2. PIC Statute

PIC statute was approved at PIC annual meeting held in August 2002

- Function: As a consultation servicing and coordination institution under the project, PIC is in responsible for providing advices on decision-making, creating favorable policy environment as well as monitoring and supervising the project implementation
- Management and 管理办法、工作程序：年会和函件形式

III. LPIC establishment

1. Importance of LPICs

➢ Property: functionally equivalent to PIC at local level, consisting of corresponding governmental authorities, as a coordination and consultation institution to carry out decisions regarding the project implementation

➢ Main tasks: In charge of barriers removal in relevant to promotion of e.e. and environmental control, to set down action plan to promote the project implementation, to develop local environmental protection policies as well as detailed rules to enforce national laws and programs concerned

➢ Expectation: to be more capable in coordination and decision making

III. LPIC establishment

- 2. Progress of LPIC establishment

  - Intercommunicated with local focus points on LPIC establishment during visit at pilot counties from October 2001 – July 2002
  - Approved "Principle ideas on LPIC establishment" at PIC annual meeting on August 9, 2002, achieved consensus on LPIC's property, tasks and the short term tasks
  - LPICs in three of the four pilot counties have been formally established by the end of August 2002

III. LPIC establishment

- 2. Progress of LPIC establishment （continued）

  - Invitation of public bidding to establish LPICs began in February 2003
    - developed TOR
    - recommended 5 potential bidders to UNIDO HQs
    - Comments and recommendation were made to UNIDO HQs based on the proposals evaluation
    - cleared the subcontractor's detailed work plan through times of consultation
  - The subcontractor's work plan was reviewed at the teleconference with UNIDO counterparts in May 2003

Progress of LPIC establishment

3. Main tasks for the next step

Assist the subcontractor to carry out the following tasks in line with their work plan

- Establish LPICs at the four pilot counties and assist them to develop their statutes respectively
- Deliver trainings to enhance the capacity building of each LPIC and their staff members
- Conduct sector investigation and assist local government authorities concerned to develop action plan to promote the sustainability of local TVEs
- Draft e.e. VA and facilitate its signature between parties concerned
- Develop schemes of e.e. monitoring and assessing system
- Make recommendations to replicate the best practices of the project in TVEs all over the country

Annex 9.6.2

Voluntary Agreements on Energy Efficiency: The International Experience

August 2003

Diversity of Approaches

(How "Voluntary" Are the Agreements?)

- Unilateral commitments
  - Programs initiated by firms themselves
- Public voluntary schemes
  - Programs initiated by public bodies, and firms agree to participate (non-mandatory regulation)
- Negotiated agreements (most common in EU)
  - Contracts (target of performance) resulting from negotiations b w public authorities and industry

(Peter Börkey and François Lévêque)

Voluntary Agreements on Energy Efficiency

- What?
- Why?
- Where?
- Who?
- How???
- So what?

Example of Unilateral Commitments

(The Responsible Care Program)

- Born in Canada in 1984; spread to over 30 countries
- Aim: to accelerate the environmental improvements in the chemical industry
- Context of its creation: following a series of major accidents (Italy, India, and Canada)
- Principles: promoting the adoption of rules for sound environmental management practice and the communication with local communities
- Implementation: a detailed action program undertaken by national professional associations
- In Canada: relatively ambitious targets and strict control procedures, due to the threat of new legislation, consumer boycotts of certain products, local pressures on the operations.
- Whereas in the beginning monitoring relied exclusively on self-reporting, it has been performed by third parties since 1993.
- Companies not complying with the codes can be excluded from the branch association, although this sanction has never been applied yet. Additional legal sanctions are possible in court.

What Is A Voluntary Agreement?

- A policy instrument aimed at improving energy efficiency (thereby reducing the growth of GHG emissions) and/or reducing environmental pollution
- Working definition
  - Agreement b w government and industry to facilitate voluntary action with a desirable social outcome

Features of Unilateral Commitments

- Set qualitative rather than quantitative pollution abatement targets and generally make no provisions for monitoring, reporting or sanctions.
  - Assessing the environmental effectiveness of such approaches is therefore difficult.
- Public authorities are absent from these schemes.
  - There is a general lack of credibility in the public eye.
- Many initiatives are perceived as primarily aimed at communicating "no regrets" pollution abatement measures toward the public opinion and policy makers.
- Some initiatives are linked to relatively strong incentives (reputation effects or the threat of stricter legislation)

Example of Pub Voluntary Schemes

(The European Eco-labeling Scheme)

- Goal: to label products with reduced environmental impact
- Awarded to products meeting the environmental criteria that have been defined previously for the relevant product group
  - washing machines, dishwashers, toilet paper, kitchen rolls, soil improvers, detergents, paints and varnishes, light bulbs, refrigerators, bed-linen and T-shirts
- A fee for the use of the eco-label, calculated as a percentage of the annual volume of sales of the eco-labelled product is charged (0.15%).
- The label is valid for three years from the date of adoption of the criteria.

Why Voluntary Agreements?

- The policy context
  - Traditional approach: command and control regulation (standard setting and enforcement)
  - Market-based economic instrument: emission charges and permit trading
- New (voluntary) approaches
  - To foster closer cooperation b w industry and public authorities
  - To find new strategies to address climate change issues (reduction of GHG emissions)

Features of Pub Voluntary Schemes

- Participating firms agree to standards (related to their performance, their technology or management) which have been developed by public bodies.
- The scheme defines the pre-conditions of individual membership, the standards to be complied with by the firms, the monitoring criteria and the evaluation of the results.
- Incentives such as R&D subsidies, technical assistance or positive effects on reputation (for example by the use of an environmental logo) can be provided by the public body.
- They are voluntary in the sense that they are take-it-or-leave-it options for firms.

Advantages of the VA Approach

- For the industry
  - A more integral approach allows companies (within sectors) to set their priorities themselves.
  - This means that an optimal trade-off is made between costs and results. So for limited costs the maximum results are achieved. (flexible and cost effective)
  - By careful phasing interference by environmental activities with normal operations can be diminished.
- For the government
  - A proactive attitude in sectors, which guarantees a better implementation with less emphasis on "control."
  - Improved predictability of environmental developments, as targets are agreed and fixed in contracts.

(Neujen)

Example of Negotiated Agreements

- The Dutch Long-Term Agreement (LTA 1)
- LTA 2
- Benchmarking Covenant on Energy Efficiency

Where Has VA Been Applied?

Country	No. of VA	Starting Year
Austria	25	1986
Belgium	14	1988
Demark	16	1987
Finland	5	1989
France	14	1971
Germany	93	1980
Netherlands	107	1987
Sweden	13	1978

Voluntary Programs in the U.S.

- Number of programs
  - 44 national voluntary initiatives by EPA and 20 voluntary climate change programs by DOE
  - Mostly unilateral and public voluntary programs
- Role in policymaking
  - Primarily to extend the scope and efficacy of individual air, water, waste, and toxics laws
- Effectiveness
  - "Marginal" to EPA's regulatory activities: "peripheral, both to business and to society"
- Reasons for lack of "popularity"
  - The existing legislative framework limits EPA's ability to use voluntary efforts to improve environmental regulation.
  - Industry attempts at self-regulation are constrained by U.S. anti-trust law.

How Does the VA Work?

(The Dutch LTA 1)

- Targets
  - 20% improvement in energy efficiency
- Timetable
  - 1989-2000 (long-term agreement)
- Coverage
  - 90% of industrial energy use (industrial branches with energy use >1 PJ a year)

Who Are the Parties to the VA?

(The Dutch LTA)

- The government
  - Not to introduce new regulation on energy efficiency
  - Provide financial support: subsidies for demonstration projects, tax reduction for energy efficiency investments, and information and consultancy services
- The industry
  - Firms join a sectoral LTA (plan of action at the branch level)
  - Firms take practical and economically feasible measures to improve energy efficiency (energy conservation plan at the firm level)
  - Report annually results on energy efficiency improvements

The Process of Signing the VA

Government (Novem) → industry

- The government agency (Novem) approaches the industry for a preliminary assessment of its energy efficiency potential.

Industry → government

- The industry association develops a Letter of Intent to undertake energy efficiency improvement, addressed to the Ministry of Economic Affairs.

Novem investigates

- Novem makes an inventory of economically viable measures (acceptable payback period) that can be undertaken in major companies within the industry association.

The LTA is signed

- By the three parties. Individual companies express their participation by accession letters.

(Novem)

Who Are the Parties to the VA?

(The Dutch LTA)

- Novem (Netherlands Agency for Energy and the Environment)
  - Prepare for the signing of the LTA
  - Provide financial support for feasibility studies, demonstration projects, research, etc.
  - Monitor LTA implementation and draw up official statistics
  - Support the transfer of knowledge

The LT Plan for Improvement of Energy Efficiency

- Assessment of energy consumption in the "reference year"
- Survey of opportunities for energy efficiency improvement
- Drafting of company energy plans
- Monitoring and energy management in each company
- R&D on new low-energy technologies
- Demonstration projects for energy savings measures
- Market introduction of low-energy techniques
- Assistance to individual companies
- Transfer of know-how and information

The Energy Conservation Plan

- Description of energy use in the base year and target year
- Company's energy efficiency target
- Possible measures to achieve the target
- Timetable and activities
- Method to determine EEI
- Reporting method

Second Generation of the Dutch LTA
(2001-2012)

- Benchmarking covenant
  - Adopted in 2001 for large and internationally competitive industries
  - 10 energy intensive industries (> 0.5 PJ per site)
- LTA 2 for other industries

How Are the Results?

- The coverage was over 90% of industrial primary energy use.
  - First LTA signed in 1992, and by 2000, there were a total of 31 LTAs with industrial associations (7 LTAs with service sectors, 3 with agricultural sectors) involving 1250 firms.
- The target was met.
  - 22.3% energy efficiency improvement (150 PJ of energy savings at 20% improvement) were observed; related CO_2 emissions showed an increase, however.
  - Chemical industry (35% of industrial energy) achieved 25% improvement; many smaller sectors failed to meet their targets.
- Firms reduced costs & improved competitiveness.
  - 700 million Euro annual cost savings in 2000
  - Savings outweighed the costs (investments) substantially.

Second Generation of the Dutch LTA
(2001-2012)

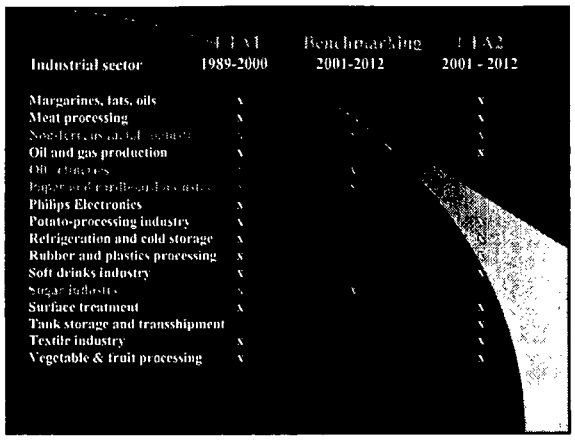
- Benchmarking
  - To be the "best of the world" (top 10%)
  - A verification bureau (with a staff of 12 from Novem) responsible for defining the benchmarks and monitoring implementation
- LTA 2
  - Adopting all process efficiency measures with a payback period of 5 years or less
  - Introducing energy efficiency measures in line with ISO 140001

Conditions for Success

- There must exist mutual trust among the parties (partners).
- Participating sectors must be homogenous and well organized.
- Information on the actual progress must be made available, without jeopardizing the confidentiality of company's sensitive data.

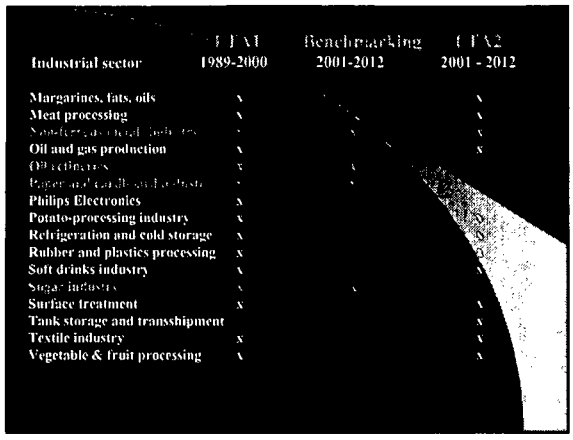
(Zeist, 1997 quoted in Nuttall)

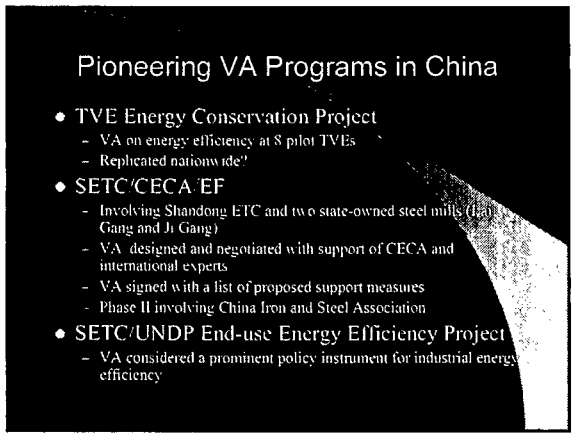
Industrial sector	LTA1 1989-2000	Benchmarking 2001-2012	LTA2 2001 - 2012
Asphalt industry	x		x
Breweries	x	x	
Building ceramics industry	x		x
Calcium-silicate brick industry	x		x
Carpet industry	x		x
Cement industry	x	x	
Chemical industry	x	x	
Cocoa Industry	x		x
Coffee-roasting industry	x		x
Dairy industry	x		x
Electric arc steel industry		x	
Fine grained ceramics industry	x		x
Glass industry	x	x	
Industrial washing	x		x
Iron and steel industry	x	x	
Iron foundries	x		x
Large individual companies	x		x



Pioneering VA Programs in China

- TVE Energy Conservation Project
  - VA on energy efficiency at 8 pilot TVEs
  - Replicated nationwide"
- SETC/CECA EF
  - Involving Shandong ETC and two state-owned steel mills (Laiwu Gang and Ji Gang)
  - VA designed and negotiated with support of CECA and international experts
  - VA signed with a list of proposed support measures
    Phase II involving China Iron and Steel Association
- SETC/UNDP End-use Energy Efficiency Project
  - VA considered a prominent policy instrument for industrial energy efficiency


Industrial sector
1989-2000
2001-2012
2001 - 2012
Margarines, fats, oils
Meat processing
Oil and gas production
Philips Electronics
Potato-processing industry
Refrigeration and cold storage
Rubber and plastics processing
Soft drinks industry
Surface treatment
Tank storage and transshipment
Textile industry
Vegetable & fruit processing


Pioneering VA Programs in China
TVE Energy Conservation Project
VA on energy efficiency at 8 pilot TVEs
Replicated nationwide
SETC/CECA/EF
Involving Shandong ETC and two state-owned steel mills (Ji Gang and Ji Gang)
VA designed and negotiated with support of CECA and international experts
VA signed with a list of proposed support measures
Phase II involving China Iron and Steel Association
SETC/UNDP End-use Energy Efficiency Project
VA considered a prominent policy instrument for industrial energy efficiency

Annex 6

Policies on Energy Conservation and Implementation in China

Yao Xiangjun, Tian Yishui
Center for Energy and Environmental Protection, MOA, China

August, 8, 2003

Low energy consumption per capita and irrational structure

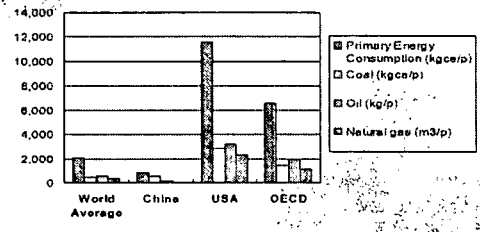
Energy Consumption	Year	World Average	China	USA	OECD
Primary Energy (kgce/p)	2000	2,064	843	1,1567	6,598
Coal (kgce/p)	2000	515.6	537.8	2,863 7	1,411.3
Oil (kg/人)	2000	578.4	177.9	3,188.8	1,950.6
Natural gas (m^3/p)	2000	397	19	2,325	1,178

Concept: Energy Conservation means to improve energy consumption management using technologically feasible, economically rational, and environmentally and socially acceptable measures, to reduce losses and waste in all chains from energy production to consumption, and to use energy resources more efficiently and more rationally

Significance: Energy conservation is one of the important in energy industry and economic development in China

- In 1981, the 4th Conference of the 5th People's Congress confirmed that "the guideline for solving energy problems is to pay equal attention to energy development and conservation, and to give priority to energy conservation in the near future"
- In 1996, the 4th Conference of the 8th People's Congress approved the 9th Five-Year-Plan and the Outline of Perspective Target for 2010, which pointed out that the energy industry should "persist to the general policy of *paying equal attention to energy conservation and development and putting conservation to the primacy*"
- The Outline of 10th Five-Year-Plan for China Economic and Social Development again stated that "*persist to paying equal attention to energy conservation and development and putting conservation to the primacy, protecting and rationally utilizing resources according to the laws, improving resource efficiency, and achieving the eternal utilization*"

Low energy consumption per capita and irrational structure



Large population and relatively short energy resources

		Time	World average	China	USA	OECD
	Populatin (million)	mid 2000	6,057.0	1,275.31	281.42	1,120.04
Exploitable fossil fuel	Coal (ton/person)	End 2000	162.5	89.8	876.4	399.2
	Oil (ton/person)	End 2000	23.5	2.6	13.1	10.0
	Natural Gas (ton/person)	End 2000	24,796	1.074	16,843	11,991

International Comparison of Energy Efficiency

		China	ECE Region		
		1997	Early 70s	Practical possible in early 1990s	Maximum possible in early 1990s
1	Mining	33.0	46	59	71
2	Transmission	68.8	76	67	75
3	End Use				
	Agriculture	30.5	30	33	36
	Industry	46.3	50	65	65
	Transportation	28.9	23	25	30
	Household and commercial	54.8	45	50-55	60-65
	Total	45.3	42	51	55
4	Energy Efficiency(2×3)	31.2	32	34	41
5	General efficiency (1×4)	10.3	15	20	30

International Comparison of Energy Consumption of Energy-Intensive Products in 1999-2000

(Journal of Energy Association, 2001, Vol 7, Japan)

	1999	2000
Coal power plant (gce/kWh)		
China	427	392
Japan	332	316
Steel industry (kgce/t)		
China (large and medium factory)	997	766
Japan	629	646
Cement (kgce/t)		
China (large and medium factory)	201.1	193.8 (1997)
Japan	122.6	125.7
Ammonia synthesis (kgce/t)		
China (large, natural gas)	1343	1200
China (small, coal or charcoal)	2263	1801
USA (large, natural gas)	1000	970

Prediction of Energy Development

With the rapid economic development and incessant improvement of people's living standard, energy demand per capita in China will increase, accordingly, the total amount of energy consumption will increase rapidly. It is predicted that energy consumption per capita will be 2.38 tce in 2040, equaling to the current world average and much lower than the level of industrialized countries (even so, the total energy consumption will reach 3.57 billion tce, more than the total amount of USA, which means that China will be the largest country in energy consumption in the world and that energy consumption in China will account for 25% of the world energy consumption, compared with 10% for now). Shortage of conventional energy resources per capita is a barrier for the sustainable development of China economy and society.

Energy conservation in China has made great achivement

- Energy conservation has achieved remarkable economic and social benefit, during the 9th Five-year-Plan:
  - Energy consumption per 10k RMB yuan of GDP (1990 price) dropped to 2.77 tce in 2000 from 3.97 tce in 1995
  - Energy consumption of major energy-intensive products decreased
  - Conserved energy resources valued 66 billion RMB yuan, reduced emission of SO_2 of 8 million tons and CO_2 (C) of 180 million tons

Major Problems

Energy conservation and resources comprehensive utilization in China exist the following major problems:

- People do not have enough recognition to the importance and stringency of Energy conservation and resources comprehensive utilization
- Laws and regulations are not perfect, and incentive policies for promoting enterprises to conserve energy resources lack, and preferential policies on resources comprehensive utilization are difficult to be put into effect in some areas.
- Prices of some energy products distort, enterprises do not have enough competition pressure. therefore, the internal motive of the enterprises for energy conservation and resources comprehensive utilization lacks.
- Technologies and equipment are old, the general level is 10~15 years behind the industrialized countries.
- Most enterprises face financing problems, and the support for energy conservation from the government is not adequate.

- Energy conservation and resources comprehensive utilization technologies have made progress, during the 9th Five-year-Plan:
  - As emphases of technological development and improvement, support to energy conservation and consumption reduction and resources comprehensive utilization technology were strengthened in enterprise technological innovation; new product development, special project of "2 high and 1 good" technological innovation, and special project of technological innovation using national debt
  - The key technologies on resources comprehensive utilization includes: heat-storage-style furnace, heat-storage-style stove, large-scale aluminum electrobath, 130 t/h and 220 t/h cycling fluidized bed boil, sulfur acid from phosphorus gypsum with co-production of cement, etc.

Existing laws, regulations, and standards on energy conservation (1)

- From 1979 to March 2000, China enacted 127 regulations related to energy conservation, of which 56 are still in effect. There are 164 national standards on energy conservation.
- "Temporary Regulations on Energy Conservation Management", enacted by the State Council in 1986.
- "Outline of Energy Conservation Technology Policies", formulated in 1984. In 1996, based on "Law of Energy Conservation of People's Republic of China", the Outline was modified and named "Outline of China Energy Conservation Technology Policies".
- "Law of Energy Conservation", enacted on January 1, 1998.

Existing laws, regulations, and standards on energy conservation (2)

- Relevant regulations. To assist the implementation of "Law of Energy Conservation, several relevant regulations have been formulated, such as "Measures for Energy Conservation Management in Key Energy Consumption Sectors", "Measures for Energy-Conservation Product Certification in China", "Measures for Electricity Conservation Management", "Regulations on Development of Cogeneration of Heat and Electricity", "Regulations on Compiling and Evaluation of 'Energy-Conservation Chapters" in Feasibility Study Report of Capital Assets Investment Projects", and "Notions for Further Promoting the Green Lighting Project in China".
- Standards on Energy Conservation. China has formulated more than 600 National Energy Standards as well as many industry energy standards, local energy standards, and enterprise energy standards. Under the administration of the National Energy Basic and Management Standardization Technology Committee only, there are about 90 basic standards, management standards, and measures standards.

Economic Policies on Energy Conservation

- To promote the technological progress, the central government established special fund for energy conservation, and provided preferential interest and interest subsidy
- Energy conservation projects has been key supporting National debt projects. Importation tax can be reduced or exempted.
- Foreign companies who invest on energy conservation project such as clean coal technology can take preferential policy on tax .
- The government formulated preferential policies to support and disseminate demonstration project on energy conservation. Importation tax of equipment and testing instrument can be reduced or exempted.
- Some local government established fund on energy conservation to support relative projects

Law of Clean Production Promotion

- On June 29, 2002, the Law was approved by the 28th Conference of the Standing Committee of the 9th National People's Congress and put in effect since January 1,2003.
- Article 2: Clean Production referred in the Law means: through measures such as applying improved design, using cleaning energy resources and materials, applying advanced techniques and equipment, improving management, and adopting comprehensive utilization, to reduce pollution from the source, improve efficiency of energy utilization, reduce or avoid the production and emission of pollutant during the production and utilization of products, and therefore mitigate or eliminate the harm to human health and environment.
- Article 3: Within the territory of People's Republic of China, any unit engaged in production and service activities and related administration shall organize and implement clean production based on the Law.

Fund on Technological Innovation for Medium & Small Science-Technology Enterprises

The central government provides 1 billion RMB yuan to establish the Fund on Technological Innovation for Medium & Small Science-Technology Enterprises, which focuses on supporting high-tech projects on electronic consultation, biological medicine, new material, environmental protection, new energy resources, efficient energy conservation. The fund is provided in three types: grant, low-interest loan, and capital investment.

- The government encourages and supports the development of advanced technology on energy conservation. The government require all industries to formulate technological standards on energy conservation, encourage them to adopt or import international advanced energy conservation technologies, to disseminate new technologies and techniques on energy conservation, and to limit or eliminate high-energy-consumption technologies and techniques.
- Government at county level or above should organize relative departments to promote the scientific and rational specialized production in accord with energy conservation requirement based on the national industry policies and energy conservation policies.
- For widely used high-energy-consumption products, the government setup limitation of maximum energy consumption and the standards on energy consumption grade, and implement the energy conservation product certification.

Organizations on Energy Conservation Administration

To enhance the monitoring and technical service of energy conservation activities, the National Energy Conservation Monitoring Center and the National Energy Conservation Test and Technical Service Center were established, and at the provincial and municipal level, there are more than 180 local and departmental such centers, with a team of about 3,200 staff. Other organizations related to energy conservation includes China Energy Conservation Association, China Energy Research Association, Energy Conservation Committee of China Science and Technology Association, and their local corresponding associations. The National Energy Technology and Management Standardization Technology Committee is responsible for formulating the standards on energy conservation. Besides, the former State Economy and Trade Commission established a energy Conservation Information Extension Center and China Energy Conservation Product Certification Center.

Annex 9.6.4

Voluntary Agreements in China

Meng zhaoli
Tsinghua University
Aug. 8th,2003

Voluntary Agreements: Content

- Energy savings & Greenhouse gas emissions reduction
- Energy efficiency measures for reaching targets
- Evaluation standards & methods
- Activity & Supervision

Basic Term & Glossary

Which Benefits Gained by Enterprises?

Social effect, protect environment, and reputation improvement .

Technical advancement, competition ability, energy-efficiency promotion, cost reduction, and government supporting policies.

1. Voluntary Agreements: Definition

Agreement between an industrial enterprise and government that establishes a mutually agreed upon target for energy-savings over a long-term period given specified supporting policies.

2. Greenhouse Gas Emissions Reduction

Reduce the greenhouse gas on the Earth, prevent tremendous menace and calamity that bring to the Earth and the human being.

3. Energy Efficiency Emission Factors

Energy Consumption

Year	1998	1999	2000	2001
Production Electricity gce/kwh	373	369	363	—
Electricity Used gce/kwh	404	399	392	387

4. Resource Utilization

- Heat recovery: coal gas, steam
- Resource reclamation: waste paper, glass, waste iron and steel
- Rubbish utilization: rubbish, slag, coal ash, shale, straw, waste tyre etc.
- Water saving

CO_2 Emission Factors

Unit: kg-c/kgce

Source form	Coal	Petroleum	Natural Gas
DOE/EIA	0.702	0.478	0.389
JNRI	0.756	0.586	0.449
CAE	0.680	0.540	0.410
GEF	0.748	0.583	0.444
ADB	0.726	0.583	0.409
Canadian Project	0.656	0.591	0.452

5. Energy-saving Techniques

- Iron & Steel (CDQ,TRT)
- Chemical
- Electric power
- Cement
- Paper making

Emission factors

Energy Consumption	kwh	kgce	kg-c	kg-CO_2	g-NO_2	g-SO_2
1kwh	1	0.400	0.272	0.997	15	30
1kgce	2.5	1	0.680	2.493	32.5	75
1kg Clinker				0.509		
1kg Cement (0.739kg Clinker)				0.3762		

6. Investment Income Analysis

- Investment capital
- Net income
- Inner yield
- Pay back periods

7. Energy Consumption

- Energy consumption (tce)
- Electricity consumption (kwh)
- Specific Energy Consumption(kgce/kg)

$$E = \sum_{i=1}^{n} \alpha_1 * P_i$$

8. Energy Conservation Ratio (ECR)

$$\gamma = \frac{E_0 - E}{E_0}$$

$$\Delta E = E_0 - E$$

9. Energy Efficiency Index (EEI)

$$EEI = \frac{\sum_{i=1}^{n} \alpha(i) * P_i}{\sum_{i=1}^{n} \alpha_0(i) * P_i}$$

10. Barriers

- Technology (Technique and equipment with potential energy-savings)
- Economy (Financing, Income evaluation)
- Policy (Environmental protection, resource & Rubbish utilization, tax, standard, ordinance, statute)
- Information communion & personnel training (International cooperation)

Voluntary Agreements Projects in China

1. China Industrial Energy Efficiency Policies Project

- Jinan Iron & Steel Group Corporation
- Laiwu Iron & Steel Group Corporation

2. WWF: Competion of Voluntary Emissions Reduction

Electricity	Transmitting electricity
Cement	Beer
Hotel	Mall

3. GEF: Energy Conservation and Greenhouse Gas Emissions Reduction in Chinese

- Hubei Lufeng Group Cement Co Ltd.
- Sicuan Yongxing Shale Brick Co Ltd.
- Jiangsu Moling Foundry Co Ltd.
- Liaoning Lüsang Cast Iron Co Ltd.

Annex 9.6.5

Process of Signing the Voluntary Agreements - Case Research in Pilot Plant in Sichuan

Tian Yishui

(CEEP)

8th Aug, 2003

2. Approach

- Assessment of Energy Efficiency Improvement Potential;
- Local Government Formulates Supporting Policies;
- Propose Energy-Efficiency Target;
- Drafting TVE-based Energy Efficiency Voluntary Agreements;
- Local Government and Enterprise Sign the Voluntary Agreement;
- Developing the monitoring and assessment system.

Pilot Plant

- Time: 27th Jun – 1st Jul
- Site: Xinjin County, Cengdu City, Sichuan Province
- Enterprise: Yongxing Shale Brick Co Ltd.

a. Assessment of Energy Efficiency Improvement Potential

- Scope: Assessment of energy efficiency improvement potential of pilot enterprise.
- Method: The methodology provides an assessment of enterprise energy intensity compares that intensity to international(or national) best practice, and provides detailed information on technologies and measures to reduce energy use.

1. Objective

- Coordinate the preparation of voluntary agreements on energy efficiency benchmarking between pilot TVE and local authorities, and facilitate the signing of the agreements;
- Develop a scheme to establish a monitoring and assessment system to monitor the implementation of voluntary agreements.

Survey of Energy Consumption for Enterprise

- General Situation of Enterprise
- Products: Solid, hollow & perforated shale bricks
- Process Steps
- Operation Condition of Main Equipments
- Description of the Implementation of Energy Management in the Enterprise
- Description of the Enterprise with Energy Usage

Survey Table of Energy Consumption for Enterprise

Year		2000		2001		2002	
Produce		Perforated brick	Solid brick	Perforated brick	Solid brick	Perforated brick	Solid brick
Production 10k		1174	4054	1565	2495	2590	2611
Energy Consumption	Coal(t)	4280	6077	4814	6433	7413	6763
	Electricity (10^4kWh)	96	139	151	79	187	76
	Gasoline(t)	11		12		12	
	Diesel oil(t)	45		6b		48	

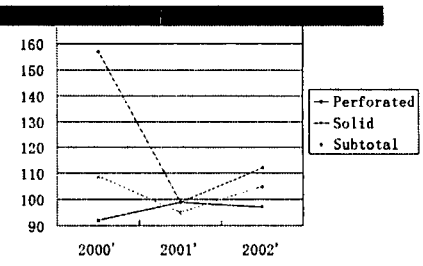
Calculation of energy consumption

Year		2000			2001			2002		
Products		Hollow	Standard	Tot	Hollo	Standard	Total	Hollow	Standard	Tot
Production (10 thousand)		1174	4016	623	1956	2595	4600	2590	2611	520
Unit consumption	Fuel (tce/10k)	2.752	1.305		1.653	1.362		1.953	1.460	
	Electricity(tce/10k)	0.330	0.128		0.307	0.119		0.269	0.117	
	total(tce/10k)	3.12	1.69		1.97	1.50		2.22	1.58	
Benchmark	Fuel(tce/10k)									
	Electricity(tce/10k)									
	Total(tce/10k)	2.22	1.58		2.22	1.58		2.22	1.58	
EPI		141	96	108	89	95	97	100	100	100

Benchmarking

- Energy benchmarking is a process in which the energy performance of the Pilot Plant is compared against a benchmark, that represents "standard" or "optimal" performance.
- Method:
  - to compile performance information from existing plants and to base the benchmark value on these data.
  - to construct a hypothetical best-practice plant that combines the best-practice energy intensity.

EEI Process



Energy Efficiency Index

$$EEI = \frac{\sum_{i=1}^{n} P_i \cdot EI_i}{\sum_{i=1}^{n} P_i \cdot EI_{i,B}} \times 100$$

Assessment Method of Enterprise Energy-Efficiency Improvement Potential

- Good energy management in Enterprise
- Improving manufacturing processes
- Utilities (steam, compressed air, etc.) and buildings
- Retrofit or strategic investments

Planned Energy Conservation Measures

- Products: Solid Brick —>Hollow & ornament brick.
- Plan:
- Investment: RMB 5,000,000
- Energy intensity: reduced by 25-30%
- Reduced amount of Coal annually: 1600~1920t
- Economy benefit: RMB3,529,000 annually.

Energy-Efficiency Target

- Time: Jan, 2004 — Dec, 2008
- Target Years: 2006, 2008
- Interim target: In comparison with the goal in the reference year, the Energy Efficiency Index shall be reduced by5%.
- Final target: In comparison with the reference year, the Energy Efficiency Index shall be reduced by 10%.

b. Local Government Formulates Supporting Policies

- Scope: Local government will formulate supporting policies that can be offered to the participating enterprises to assist them in achieving their energy efficiency targets.
- Supporting policies can include: reduce or exempt the enterprise from income tax, local government Subsidies, priority in energy-efficiency projects, local financial assistance, information dissemination, and awards and recognition.

d. Drafting TVE-based Energy Efficiency Voluntary Agreements

- Activity: Drafting TVE-based Energy Efficiency Voluntary Agreements according as characteristic of VA, development conditions of Chinese TVEs, survey reports of pilot county, and fact of enterprise.
- Local government and enterprise will negotiate about context of VA.

c. Propose Energy-Efficiency Target

- Based on the enterprise's current conditions and energy-efficiency improvement potential, the enterprise will formulate an interim energy efficiency target which takes into account the level of existing equipment and technology and apply pressure on itself to achieve a higher level of efficiency.

Energy Efficiency Voluntary Agreement

- 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.

Parties to the Voluntary Agreement

Party A: Xinjin County Local Government, Chendu City, Sichuan Province.

Party B: Yongxing Shale Brick Co Ltd in Xinjin County, Chendu City, Sichuan Province.

Monitoring Context

- Annual Survey of Energy Consumption for the enterprise;
- Energy management measures of the enterprise;
- annual Energy Efficiency Index (EEI);
- And so on.

e. Local Government and Enterprise Sign the Voluntary Agreement

- assessment: Monitoring and Assessment Team will evaluate the energy-efficiency target reasonable which include if the target fit into the country's current energy and environment policy and regulations.
- Scope: Once the target are approved, it become the targets the enterprise promises to achieve within the Voluntary Agreement.

f. Developing the monitoring and assessment system

- Enterprise initiate to submit the annual Supervision Report annually.
- Indicator: Set assessment standard (success and failure)；
- Superintendent: Monitoring and Assessment Team.

Annex 9.6.6

"Establishment and Capacity Building of Local Policy Implementation Committees"

Work Plan

TEDC

EETDC

2003.8.9

Main project tasks (1)

- To establish LPICs
  - Software
    - Business Principles and Functions → Statute
    - Organization
    - Staffing
  - Hardware
    - Office as well as necessary office facilities

Objective of the Work Plan

- To fulfill tasks listed in the subcontractor's briefing report in accordance with the subcontract and provide a guideline for the subcontractor as well as the four LPICs in implementing the project.

Main project tasks (2)

- Build-up of self-sustainable development capability of LPICs
  - Training
  - Technical assistance to TVEs at the pilot counties
    - Action Plan
    - Voluntary Agreement

Implementation Schedule

- It is scheduled for 8 months from July 2003 to February 2004

Main project activities (1)

- To establish LPICs at the four pilot counties and assist the local governments to develop the LPIC statute
- To provide training services thereby enhancing the capacity building of LPICs
- To conduct industrial investigation and assist local governments to develop an action plan to promote the sustainable development of TVEs.

Main project activities (2)

- To develop an energy efficiency voluntary agreement and facilitate parties concerned to sign the document
- To make proposals for national replication of barrier removal activities

Key Definitions (1)

- "PIC": Policy Implementation Committee, established by MOA on 27 February, 2001
- "LPIC": Local Policy Implementation Committee, established by __ County Government on _____
- PMO: Project Management Office of the project entitled "Energy Conservation and Green House Gas Emissions Reduction in Chinese TVEs" – Phase II

Key Definitions (2)

- "CTA": The Chief Technical Adviser of the project
- "Subcontract": The subcontract namely "Establishment and Capacity Building of Local Policy Implementation Committees" under the project

Key Definitions (3)

- "Subcontractor" : TEDC in collaboration with EETDC
- "TOR" : Terms of Reference for the subcontract entitled "Establishment and Capacity Building of Local Policy Implementation Committees"
- "PTPMC" : production Technology and Product Marketing Consortium, now Hongyuan Company
- "TVE" : Pilot township and village Enterprises at the four pilot counties

Key Definitions (4)

The four pilot counties/districts and sub-sectors

- Brick making: Xinjin County, Chengdu, Sichuan
- Cement: Tieshan District, Huangshi, Hubei
- Metal casting: Jiangning District, Nanjing, Jiangsu
  Lushunkou District, Dalian, Liaoning

Work Plan

The work plan is designed in three steps in line with the subcontract TOR

- 1st step: To gather information/technical data and modify the project implementation plan
- 2nd step: To deliver trainings and investigate at the pilot counties/districts
- 3rd step: To facilitate the signing of the VA and deliver the second training

1st Step

- Date: July 1 - 31, 2003Objectives
  - Gather and process information/technical data
  - Modify the project implementation plan
  - Develop the framework of LPIC Statute, the action plan and the VA
  - Gather and compile training materials and make preparation for the first training course
  - Investigate training needs and conduct investigation at Xinjin County, Chengdu, Sichuan
  - Submit the first progress report

2nd Step

- Date: 1 August – November 10, 2003
- Objectives
  - Preparation of training materials
  - Delivery of training courses
  - Conduct of follow-up investigation at Xinjin County and modify the report accordingly, Investigate at the other three pilot counties/districts
  - Submit the second progress report

3rd Step

- Date: 11 November 2003 – February 2004
- Objectives
  - Facilitate the VA signing
  - Prepare and deliver the second training
  - Draft and submit the final report (draft)
  - Modify and submit the final report

Annex 9.6.7

LPIC Statute (framework)

TEDC

EETDC

2003.8.9

Key definitions (1)

- "PIC": Policy Implementation Committee, established by MOA on 27 February, 2001
- "LPIC": Local Policy Implementation Committee, established by __ County Government on _____
- "PTPMC" : Production Technology and Product Marketing Consortium which has currently been registered as Hongyuan Energy and Environmental Protection Company Ltd. Beijing, china
- "TVE" Township and Village Enterprises at the four pilot counties

Project background(1)

- **"Establishment and Capacity Building of Local Policy Implementation Committees" is a subcontract under the project entitled "Energy Conservation and Green House Gas Emissions Reduction in Chinese TVEs" – Phase II**
- **Short term objectives**

  To assist the pilot county governments to establish LPICs and build up their capability in sustainable development by providing technical support and trainings, e.g. development of Action Plan and establishment of Voluntary Agreement mechanism.

Key definitions (2)

Subcontractor: TEDC in collaboration with EETDC

R C F: Revolving Capital Funds

PMO: Project Management Office of the project entitled "Energy Conservation and Green House Gas Emissions Reduction in Chinese TVEs" – Phase II

Project Background (2)

- **Ultimate Objectives**

By adopting the VA mechanism, to assist TVEs in sub-sectors of brick making, cement, metal casting and coking to remove key market, policy, technological, and financial barriers to the production, marketing and utilization of energy efficient technologies and products in these industries and to improve the energy efficiency and reduce green house gas emissions thereby promoting the sustainable economic development and improving the environment all over the county.

Objectives of LPICs

- To develop such policy environment which is propitious to the improving of energy efficiency and environmental protection all over the county.
- To assist county governments to better implementing laws, regulations and policies in relevant to energy efficiency and environmental protection.

Responsibilities of LPICs (1)

- Project implementation and consultation services
- Deliberation with TVEs and supervise on the signing and implementation of VA
- Assist county government to better implementation of laws, regulations and policies in relevant to energy efficiency and environmental protection
- Assist PIC, Hongyuan (formerly PTPMC) and RCE to evaluate project proposals submitted by TVEs

Section One General provision

- Clause 1: Characters of LPIC
- Clause 2: Objectives of LPIC

Responsibilities of LPICs (2)

- Running consecutively an incentive mechanism to promote VA implementation
- Replicating the best practices in relevant to energy efficiency and greenhouse gas emissions reduction in TVEs all over the county
- Making suggestions on the replication of the best practices gained from the pilot project

Section Two LPIC Organization

- Clause 3: LPIC membership
- Clause 4: Term of each LPIC member
- Clause 5: Meeting schedule
- Clause 6: Term, authority and duty of 主任委员任期、权力与义务
- Clause 7: Secretariat of LPIC

Framework of LPIC Statute

LPIC statute consists of 6 sections:

- General provision
- Organization
- Responsibilities
- Management and work procedures
- Relationship between LPIC, PIC and TV
- supplementary articles

Section Three Authority and responsibility

- Clause 8: Authority and responsibility of LPIC

Section Four Management and work procedure

- Clause 9 – 10

  LPIC routine management and work procedure

Conclusion

- This is only a draft statute. comments from the potential LPIC members of the four pilot counties are welcome.

Section five: Relationship between LPIC, PIC and TVEs

- Clause 11 – 15

  Relationship between LPIC, PIC and TVEs

Section Six Supplementary articles

- Clause 15 – 16

  Effectiveness and interpretation

Annex 9.6.8

UNDP/GEF "Energy Conservation and Greenhouse Gas Emissions Reduction in Chinese TVEs- Phase II"

The Establishment and capacity building of LPICs

Action Plan

Beijing

August 2003

1

Action Plan

Summary

I. Introduction

II. Illustration of the Action Plan Compiling

II. Framework

2

I. Introduction

- 1.Definitions
- 2.Objectives
- 3.Contents
- 4.Importance
- 5.Working steps
- 6.Survey scopes

3

I. Introduction 1.1 Defination-1

Definitions

Action:

The state or process of acting or doing for a certain objective

Plan:

A scheme, program, or method worked out beforehand for the accomplishment of an objective

4

I. Introduction 1.1 Definition-2

Role of Action Plan in the project implementation:

Guiding principles, programming and activities developed by LPIC to remove policy barriers to promote energy efficient technology in TVEs.

5

I. Introduction 1.2 Objectives

Objectives:

To promote the removal of policy barriers to energy efficient technology in TVEs by various means, e.g. issuing governmental regulations and decrees in accordance with laws, acts and codes related, voluntary actions taken by TVEs, as well as other economical measures.

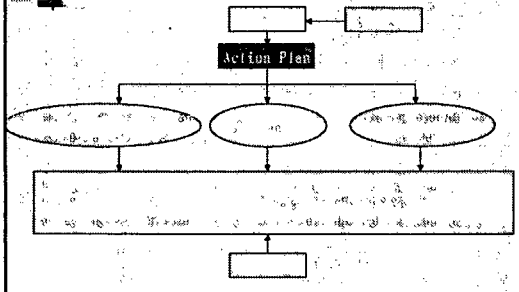
6

I. Introduction 1.3 contents

- Investigate and identify policy barriers to energy efficient technology in TVEs restricting policy enforcement, technology update, financing and product marketing;
- Develop the sector's short term and mid - long term goals in energy efficiency and GHG emissions reduction.
- Develop measures to remove barriers identified

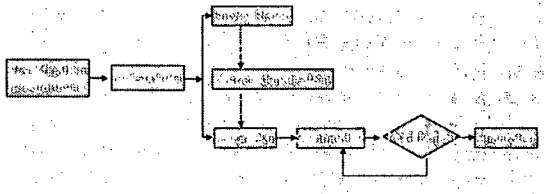
7

I. Introduction 1.4 Importance



8

I. Introduction 1.5 Working steps



9

I. Introduction 1.6 Survey Scope

- Organization of TVEs and key issues related to their development
- TVE's ownership reform
- Current status of the sector
- Current effective policies and regulations related to E.E. and environmental protection and their enforcement
- Deliberate framework of E.E. technical innovation and VA

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I. Introduction
1.6 Case study at Xinjin County,Sichuan

- **LPIC member colloquium**
- **Xinjin brick making TVEs' colloquium**
- **Visit and deliberate framework of E.E. technical innovation and VA with entrepreneurs of the pilot TVE**

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II. Illustration of the Action Plan Compiling

- **1.Guiding principles**
- **2.Essential consideration**
- **3.Framework**

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II. Illustration of the Action Plan Compiling

2.1 Guiding principles

To steer and regulate the market through governmental policy developing and implementing thereby promoting the adoption of E.E. technology shunting to market-oriented manner; To develop such a market-oriented mechanism that promoting TVEs to be self awakened to adopt E.E. and GHG emissions reduction technologies.

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II. Illustration of the Action Plan Compiling

2.2 essential consideration

- To be driven by the government
- To take TVEs as the subject of technical innovation
- To be steered by market forces
- To remove policy barriers continually

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II. Illustration of the Action Plan Compiling

2.3 Framework

- Background
- Objectives
- Implementation scheme
- Action Plan monitoring

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III. Framework of Action Plan

1. Background
2. Objectives
3. Implementation scheme
4. Action Plan monitoring

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III. Framework of Action Plan

1.Background

Background

- Scope, requirement and objective of the project
- Current status of the local sector
- Current effective laws and regulations in relevant to policy, marketing, technology and financing
- Mechanism related to policy implementation
- Barriers to policy, technology, financing and product marketing

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III. Framework of Action Plan

2.Objectives

Objectives

- Short term development objectives (2003-2005)
- Mid-long term development objectives (2006-2008)

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III. Framework of Action Plan

3.1 Implementation of the plan

To team up and establish network

- to team up or make use of the current available expert team
- to establish local industrial energy efficiency network

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III. Framework of Action Plan

3.2 Implementation of the plan

- **Promoting TVEs' energy efficiency**
  - VA signed by TVEs
  - Adoption of ISO14000 to be widely promoted
  - Modern enterprise system to be established

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III. Framework of Action Plan

3.2 Implementation of the plan

- **Governmental driving force**
  - Financial policy beneficial to E.E. and GHG emissions reduction
  - Administration policy beneficial to promoting E.E. and GHG emissions reduction
  - Economical policy incentive to E.E. and GHG emissions reduction
  - Preferential treatment policy beneficial to E.E. and GHG emissions reduction

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III. Framework of Action Plan

3.4 Implementation measures

- **Enhancing promotion**
- **Establishing a reward-punishment mechanism**

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III. Framework of Action Plan

4. Monitoring

- **Develop assessing methods**
- **Establish reporting system of energy consumption (monthly report)**

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Annex 9.7.1

LPIC Evaluation Document One

Working Procedure of LPIC Evaluation

1. PIC is responsible for evaluation of LPICs.
2. LPIC submits to the PIC Secretariat (the Secretariat in short) LPIC Annual Work Report (Work Report in short) before January 31 every year. Document Two gives the form of the Work Report.
3. The Secretariat presents the Work Report to PIC members within seven days after it is received.
4. PIC members review and evaluate the Work Report against the LPIC Evaluation Form, which should be handed over to the Secretariat before March 30.
5. The Secretariat will sum up the completed evaluation forms and submit to PMO a summary of the evaluation.
6. PMO examines the Work Report and the evaluation summary and if necessary, makes field survey of individual LPIC. An annual evaluation after the examination will be circulated.
7. It is proposed that at the project end, a national organization administrating TVEs appoint an agency to take over the Secretariat's responsibility of LPIC evaluation. A panel of experts is proposed to examine the evaluation.

LPIC Evaluation Document Two

LPIC Annual Work Report

1. General information			
1.1 Contact information			
LPIC Name			
Office Address			
Contact		Tel	
1.2 Staff(information of replacing staff including work unit, position, education and working experience)			

LPIC Annual Work Report

1.3 Work Report		
Major activities	**Results**	**Review of Action Plan Implementation**
1.3.1 Coordination for and formulation of policy		

LPIC Annual Work Report

Major activities	**Results**	**Review of Action Plan Implementation**
1.3.3 TVE performance in VA implementation		
1.3.4 Replication of VA		

LPIC Annual Work Report

Major activities	**Results**	**Review of Action Plan Implementation**
1.3.5 Others		

LPIC Annual Work Report

1.4 Work Plan for next year		
Major activities planned	**Expected Results**	**Review of Action Plan Implementation**

LPIC Evaluation Document Three

Rules of LPIC Annual Evaluation

I. Organization and staff

No.	Evaluation Item	Evaluation	Proposal
1	Office address fixed and furnished with modern office equipment		
2	Established with official document		
3	Profile of LPIC staff available, whose special knowledge and position are in conformity with job requirements		
4	Full-time staff in conformity with job requirements in terms of staff number, special knowledge and capacity		
5	Operation in strict compliance with LPIC statute		

II. Annual Work

No.	Evaluation Item	Evaluation	Proposal
6	Active coordination for and formulation of environment policy, favorable policy for pilot TVEs in particular		
7	Active development of policies aimed at promoting industrial energy conservation and emissions reduction at the local level		
8	Training and survey activities aimed at improving the environment awareness of local officer's and TVE executive's at the local level		
9	Clear evaluation of TVE performance in implementing VA and technical upgrading, and assessment of TVE energy efficiency potentil		
10	Replication of VA mechanism in non-pilot TVEs and		

	industries (VA signed every year by and between TVEs and the local government)		
11	Effective implementation and timely modifications and adjustment of Action Plan aimed at better energy efficiency and emissions reduction		
12	Annual work plan developed and fulfilled based on Action Plan		

III. Target

No	Evaluation Item	Evaluation	Proposal
13	EEI fulfilled as set in immediate objectives		
14	EEI reduction for 2005 fulfilled as immediate objective		
15	EEI reduction for 2008 fulfilled as medium and long term objectives		

Notes: 1. Evaluation should be done by "A" for good; "B" for OK; "C" for not OK
2. Excellent for less than 3 "B" and no "C"; OK for less than 5 "B" and less than 3 "C "; not OK otherwise

Annex 9.7.2

Energy Efficiency Voluntary Agreement of Township and Village Enterprises

Monitoring and Assessment System

Project of *Energy Conservation and Greenhouse Gas Emissions Reduction in Chinese Township and Village Enterprises – Phase II* aimed at reducing greenhouse gas emissions in China from the TVE sector by increasing the utilization of energy efficient technologies and products in the brick, cement, metal casting, and coking sub-sectors. The Monitoring and Assessment System is formulated to promote the development of Energy Efficiency Voluntary Agreement of Township and Village Enterprises, to monitor the implementation of the Voluntary Agreement, and to assess the effect of the Voluntary Agreement.

1. Obligations

The Project established the framework to remove barriers, including National Policy Implementation Committee (PIC), Local Policy Implementation Committees (LPIC), and Product Technology and Product Marketing Consortium (PTPMC). These organizations have relevant obligations in the Monitoring and Assessment System of the Energy Efficiency Voluntary Agreement.

1.1. National Policy Implementation Committee (PIC)

Provide guidance for implementation of energy efficiency voluntary agreement and assess the overall status of implementation;

Assess the application of loan for energy conservation recommended by LPIC;

Recommend loan proposals to the PTPMC;

Give encouragement or awards to organizations and individuals who make notable achievement for the Project;

Sum up the experiences regarding the Voluntary Agreement, and

Disseminate the concept of Voluntary Agreement and promote the development of Voluntary Agreement projects nationwide.

1.2. Local Policy Implementation Committees (LPIC)

Under the guidance and coordination of PIC, sign Energy Efficiency Voluntary Agreement with Demonstration Enterprises on behalf of the local government. Provide policy support for successful implementation of the Voluntary Agreement and keep the target of the Voluntary Agreement consistent with the National target.

1.3. Technical Team(TT)

The Technical Team consists of Voluntary Agreement experts, Energy Efficiency experts, technical experts (brick, cement, metal casting, and coking), economic experts, and legal experts. The Technical Team is responsible for the monitoring and evaluation of the Energy Efficiency Voluntary Agreement.

The Technical Team is responsible for evaluating the Energy Conservation Plan of the Demonstration Enterprises, including whether or not the target of energy conservation is ambitious and the feasibility of the Plan. It also assesses the Annual Monitoring Report, Interim Report, and the Final Report: checks the authenticity of the data submitted by Demonstration Enterprises, assesses the completion of the energy conservation target, and the suggestion on Agreement modification. The Assessment results shall be informed to the PIC, the LPIC, and the Demonstration Enterprises in written forms.

1.4. Demonstration Enterprises

In order to achieve the energy conservation target on time, the Demonstration Enterprises shall formulate detailed energy conservation plan. After the assessd by the Technical Team and approved by the LPIC, the Plan shall be seriously implemented by the Demonstration Enterprises. During the implementation of the Voluntary Agreement, the Demonstration Enterprises shall submit Annual Monitoring Report to the PIC, the LPIC, and the Technical Team.

2. Monitoring and Assessment

2.1. Measures for Monitoring

During the implementation of the Voluntary Agreement, the Demonstration Enterprises shall submit Annual Monitoring Report in written form to the PIC, the LPIC, and the Technical Team in the first quarter of the year.

2.2. Content of Monitoring

Annual Monitoring Report is used to indicate the information regarding energy efficiency in both qualitative and quantitative forms. The major contents are:

(1) Status of Energy Consumption;

(2) Status of Implementation of Energy Conservation Plan: energy management measures and their effects, implementation of the energy conservation measures.

(3) Other projects or measures to improve energy efficiency

(4) Achievement, existing barriers, energy conservation plan for the next year, and measures or projects that were or will be modified.

(5) Achieved experiences and suggestion for perfecting the energy efficiency voluntary agreement.

For the template of the Annual Report of Demonstration Enterprise for the Energy Efficiency Voluntary Agreement, see Appendix 1.

2.3. Assessment System

The Technical Team assesses the implementation of the Voluntary Agreement based on the Annual Report, and produces the Assessment Report. See Table 1 for the Assessment System of the Energy Efficiency Voluntary Agreement. Scoring formula is:

$$P = \sum_{i=1}^{4} p_i \times X_i$$

where:

P = Total Score

p_i = Score of Item i

X_i = Weight of Item i, $\sum_{i=1}^{4} Xi = 1$;

If the total score is more than 4, the conclusion is *excellent*. It means that the enterprise meets all the targets that the Voluntary Agreement defines, and achieves good results in all aspects. If the total score is between 2 and 4, the conclusion is *pass*. It means that the enterprise has basically done the obligations that the Voluntary Agreement defines, but has some shortcomings in some aspects. If the total score is less than 2, the conclusion is *fail*. It means that the enterprise fails to meet the targets of energy conservation that the Voluntary Agreement defines, and shall adopt

corresponding remedy measures.

Table 1 Assessment System of Energy Efficiency Voluntary Agreement

Criteria	Weight (X_i)	Content	Method (p_i)
(1) Effect of energy conservation	0.35	Quantity of energy conservation, energy conservation ratio, energy consumption per unit (or value), indirect energy conservation quantity, quantity of CO_2 emission reduction, economic benefit.	Experts from the Technical Team give the score: Excellent: 5 Good: 4 Normal: 3 Pass: 2 Fail: 1
(2) Application of Energy Conservation Measures	0.35	Application of new technologies and new technical process, implementation status and effect, comparison between energy consumption of major products and domestic and international advanced level, architecture energy saving, waste recycling, co-generation, use of renewable energy resources.	
(3) Energy Management	0.20	Regulations on energy management, energy conservation responsibility system and organization system, quantitative management of energy conservation, examination of energy consumption, encouragement mechanism, training on energy conservation	

(4) Information extension	0.10	Information exchange, extension of Voluntary Agreement	

3. Economic Assessment of Energy Conservation Technology

3.1. Investment

Investment for the Energy Conservation Project includes capital assets investment and new floating capital.

3.2. NPV

NPV can be used to measure the economic effect.

3.3. IRR

If IRR is bigger than the expected lowest return rate of the industry, the project is considered feasible. When comparing different alternative projects, the project with the biggest IRR is the best.

3.4. Investment Payback Period

The Investment Payback Period indicates the time that accumulative income equals to the accumulative expenditure.

Appendix 1: Annual Report of Demonstration Enterprise for the Energy Efficiency Voluntary Agreement (template)

1. Enterprise Information

Name:

Address: Zip:

Contact: Telephone:

Starting and End Date of Monitoring:

Brief Introduction: (mainly on status of management and R&D and the difference from the previous year)

Production Statistics: (mainly on product types, production quantity, and production values)

2. Energy Consumption

Type of Energy	Consumption quantity	Standard coal coefficient	Consumption Quantity (tce)	CO_2 Emission (t)
Coal (t)				
Electricity(kWh)				
Diesel (t)				
Gasoline (t)				
Coke (t)				
Coal Gas (t)				
Natural Gas (m^3)				
Thermal Power (kcal)				
Total				
Production				
Unit product Energy Consumption				

Note: The content can be adjusted based on the conditions of the enterprise.

3. Implementation of Energy Conservation Plan

Measures	Completion Date	Status

4. Factors that influence the energy conservation activities

Factor	Details

5. Energy Conservation Plan and Measure Adjustment for Next year

Energy Conservation Plan and Measure Adjustment	Starting Date	Expected Amount of Energy Conservation

6. Feedback Information (mostly the information on Voluntary Agreement that the enterprise want to submit to the PIC and local government)

Appendix 2: Factors, Method, and Calculation

2.1 Conversion Coefficient

Table 1 Conversion Coefficient of Energy

Type of Energy	Average LTV	Coefficient
Natural gas	9310(kcal/m^3)	1.3300(kgce/m^3)
LPG	12000(kcal/m^3)	1.7143(kgce/m^3)
Gasoline	10300(kcal/kg)	1.4714(kgce/kg)
Kerosene	10300(kcal/kg)	1.4714(kgce/kg)
Diesel	10200(kcal/kg)	1.4571(kgce/kg)
Coal	5000(kcal/kg)	0.7143(kgce/kg)
Clean coal	6300(kcal/kg)	0.9000(kgce/kg)
Coke	6800(kcal/kg)	0.9714(kgce/kg)
Electricity	Equaivalent:2681(kcal/kg)	0.383(kgce/kWh)
Thermal Power		1.4286(kgce/kg)

2.2 Direct Energy Conservation-CO_2 Emission Factor

(1) CO_2 Emission from fuels for production

If fuels such as coal, oil, and natural gas are used in the production process, GHGs such as CO_2 will be emitted to the atmosphere. CO_2 Emission from fuel I is calculated as below:

$$Q=P \times EC \times EF$$

where

Q = CO_2 Emission of i type fuel (t-CO_2);

P = Consumption Quantity of fuel i (t);

EC = Conversion factor of i type fuel (GJ/t), means the Energy Content of unit mass of fuel, see Table 2;

EF - CO_2 Emission factor of i type fuel (t/GJ), means the CO_2 Emission of unit mass of fuel, see Table 2.

CO_2 Emission shall be calculated for each type of fuel.

Table 2 CO_2 Emission Factor

Type of Energy	Energy content of fuel (GJ/t)	C Emission Factor (t-C/TJ)	CO_2 Emission Factor (t-CO_2/TJ)
Natural gas[1]	39.00	15.32	56.22
LPG	47.31	17.32	63.12
Gasoline	44.80	18.90	69.36
Kerosene	44.75	19.60	71.93
Diesel	43.33	20.20	74.13
Fuel oil	40.19	21.10	77.43
Anthracite	24.49	26.35	96.70
Coking coal	20.73	24.26	89.03
Brown coal	13.19	24.08	88.37
Coke	28.47	29.50	108.26

[1] unit: GJ/km^3.

(2) CO_2 Emission of electricity consumption during production

Production in the demonstration enterprises consumes electricity, which consumes primary energy resources and emits CO_2. Table 3 shows the Standard Coal Consumption for Electricity Generation in China. CO_2 emission is calculated as below:

$$Q = P \times EF / 1000$$

where:

Q = CO_2 Emission of electricity consumption (t);

P = Electricity Consumption (kWh);

EF = Electricity CO_2 Emission Factor (t/kWh), see Table 4.

Table 3 Standard Coal Consumption for Electricity Generation in China

Unit: gce/kWh

Year	1999	2000	2001	2002
Standard	399	392	385	383

Table 4 Energy Conservation-CO_2 Emission Factor

Energy Saving (Material)	kWh	kgce	kg-C	kg-CO_2	g-NO_x	g-SO_2
1kWh	1	0.400	0.272	0.997	15	30
1kgce	2.5	1	0.680	2.493	32.5	75
1kg clinker				0.509		

(3) CO_2 Emission in Cement Production

Carbonate in cement production causes CO_2 Emission. In China, 1.264 t of limestone ($CaCO_3$) is consumed to produce 1 t of clinker. CO_2 Emission is calculated as below:

$$Q = P \times EF / 1000$$

where:

Q = CO_2 Emission from clinker (t);

P = Production Quantity of Clinker (t);

EF = Clinker CO_2 Emission Factor (t/t clinker), see Table 4.

2.3 Calculation of Energy Conservation Target

(1) Energy Efficiency Index (EEI)

Energy Efficiency Index reflects the difference of energy consumption between the target year and the base year. In Voluntary Agreement, EEI is used to monitor and assess the status of completion of energy conservation target. EEI is calculated as below:

$$EEI = \frac{\sum_{i=1}^{n} P_i \cdot EI_i}{\sum_{i=1}^{n} P_i \cdot EI_{i,B}} \times 100$$

Where:

EEI = energy efficiency index

n = number of products to be aggregated

Ei_i = actual energy intensity of process step for product i

Pi = actual production quantity for product i.

(2) Energy conservation rate

Energy conservation rate reflects the degree of energy conservation. Energy conservation rate is calculated as below:

where:

$$\xi = 1 - \sqrt[n]{\frac{EI}{EI_0}} \qquad \gamma = \frac{EI_0 - EI}{EI_0}$$

γ	= Energy Conservation Rate (%)
ξ	= Annual Average Energy Conservation Rate (%)
EI	= Energy Consumption per Unit Product in Target Year
EI_0	= Energy Consumption per Unit Product in Base Year
n	= Number of years between Target Year and Base Year

Annex 9.8

Workshop on Energy Efficiency Voluntary Agreements

The Second Training Materials

第二次培训材料

For

Establishment and Capacity Building of Local Policy Implementation Committees

For

UNDP/GEF Energy Conservation and Greenhouse Gas Emissions Reduction in Chinese Township and Village Enterprises – Phase II

Fragrance Hill Hotel, Beijing

March 29—31, 2004

Public Seminar on
Energy and Climate Change Policies in Europe and the United States

First Floor Conference Room, Ministry of Agriculture
March 29, 2004

Agenda

9:00-10:20 New Developments in Energy and Climate Policy in the European Union
Dr. Kornelis Blok, Managing Director, Ecofys, The Netherlands

10:20-10:30 Tea/Coffee Break

10:30-11:50 Voluntary Greenhouse Gas Emissions Mitigation Efforts in the U.S.
Ms. Lynn Price, Deputy Group Leader, International Energy Studies Group, Lawrence Berkeley National Laboratory, USA

11:50-12:00 Q&A

UNDP/GEF Energy Conservation and Greenhouse Gas Emissions Reduction in Chinese Township and Village Enterprises – Phase II

Workshop on Energy Efficiency Voluntary Agreements

Fragrance Hill Hotel, Beijing
March 30, 2004

Agenda

9:00-9:10 Opening remarks
Mr. Wang Xiwu, Senior Administrator of the Policy Implementation Committee

9:10-9:40 UNDP/GEF TVE Energy Conservation Project: Pioneering the VA Approach in China
Dr. Zhang Zhihong, Chief Technical Advisor

9:40-11:00 International Experience with Monitoring of Voluntary Agreements
Dr. Kornelis Blok, Managing Director, Ecofys, The Netherlands

11:00-11:50 Results of an Energy-Saving Program in a Dutch Foundry
Mr. Staf Henderieckx, Gietech BV, Former Director of Gieterij Middelburg, The Netherlands

11:50-12:00 Q&A

12:00-13:00 Lunch

13:00-13:30 Policy and Legislation Recommendation for Energy Saving and Pollution Reduction Cooperative Agreements
Professor Wang Xuejun, The Environment Institute, Peking University

13:30-14:40 Energy Efficiency Voluntary (Cooperative) Agreement Pilot Project in Shandong Province
Ms. Lynn Price, Deputy Group Leader, International Energy Studies Group, Lawrence Berkeley National Laboratory, USA
Ms. Jiang Yun, China Energy Conservation Association

14:40-15:00 Q&A

15:00-15:10: Tea/Coffee Break

15:10-15:50 Voluntary Commitment to Emissions Reduction: The WWF Initiatives
Dr. Gan Lin, WWF China (to be confirmed)
Mr. Ding Hang, Zhongjie Blue Sky Investment Management Company (to be confirmed)

15:50-16:30 Developing Energy Efficiency VAs in the Chinese TVE Sector: Preliminary Results
Mr. Tian Yishui, MOA Center for Energy and Environmental Protection
Professor Meng Zhaoli, Tsinghua University

16:30-17:50 Design and Evaluation of VA Policies and Programs
Dr. Kornelis Blok, Managing Director, Ecofys, The Netherlands

17:50-18:00 Q&A

18:00 Adjourn

Discussions about the establishment and capacity building of LPICs

Fragrance Hill Hotel, Beijing
March 31, 2004

Agenda

9:00-9:20	The Establishment and Capacity Building of LPICs: Review of Achievements Ms. Wang Hui, team leader of the subcontractor
9:20-9:50	The Establishment and Capacity Building of LPICs: Design, Implementation and Modification of Action Plan Ms. Zhou Hong, legal expert of the subcontractor's team
9:50-10:10	Discussions
10:10-10:30	The Establishment, Operation and Anticipation of Dalian LPIC Mr. Yuan Hui, deputy director of Dalian TVE Bureau
10:30-10:45	Break
10:45-11:20	Technical upgrading for energy efficiency and the development of enterprise Mr. Liang Xinbao, chairman of Jiangsu Moling Metal Casting Factory
11:20-11:30	Discussions
11:30-13:30	Lunch
13:30-13:50	Highlights of Year 2004 Work Plan for the TVE Project and the Plan for the establishment and capacity building of the other LPICs Ms. Wang Guiling, deputy director of PMO
13:50-14:10	Major activities for 2004 under the subcontract to support sustainable development of Hongyuan Co Mr. Wanghai, managing director of Hongyuan
14:10-16:30	Discussions about capacity building of pilot TVEs and counties
16:30-17:00	Summing-up of the workshop Mr. Wang Xiwu

"LPIC Training Workshop"

Minutes

Time: March 29 to April 1, 2004

Venue: Beijing Xiangshan Hotel

Topics: Energy and environmental policies in developed countries, significance, approaches and experience of VA application in China, barriers to VA application in China, mechanism for sustainable development of LPICs, technical upgrading scheme for pilot TVEs

Training form: Lectures given by national and international experts, followed by discussions

Participants: Officers from UNDP and UNIDO Beijing offices, GEF China Office, the State Development and Reform Commission, MOA TVE Bureau and Science & Technology Dept, China Energy Conservation Association, as well as US Energy Foundation Beijing Office; experts from the Environment School of Peking University, US and Dutch energy policy experts; LPIC staff and executives from the pilot sites.

I. Context

The tasks for Phase I of the subcontract for the establishment and capacity building of LPICs have been completed as contracted. This training workshop is another important one aimed at reviewing Phase I and enabling the LPICs to move on with replication of the best practices and promotion of VA mechanism throughout the pilot counties.

II. Workshop activities

Mr. Wang Xiwu, senior administrator of the PIC Secretariat, chaired the two-day workshop.

The first-day session was focused on VA. Mr. Zhang Zhihong, the Project CTA, made a presentation on the UNDP/GEF Chinese TVEs project as a pioneer in China's VA approach. Ms Lynn Price from the US LBL and Ms Jiang Yun from China Energy Conservation Association talked about the energy efficiency VA pilot project in Shandong Province. Mr. Kornelis Blok, executive director of Ecofys, shared with the participants, international experience in monitoring VA application including the design and evaluation of VA policies and programs. Mr. Staf Henderieckx from Gietech BV introduced the achievements the Holland metal casting industry has made in energy efficiency. Mr. Wang Xuejun, Professor from the Environment School of Beijing University made in his

presentation, some policy and legislation recommendations for energy saving and pollution reduction cooperative agreements. Ms. Qiao Liming, from WWF China shared with the participants, information about its program of climate savers and international experience in this respect. Ms Ding Hang from ? talked about potential of energy conservation and emission reduction in some Chinese industries, and the framework of WWF program of Enterprise's Emission Reduction Voluntary Activities. Finally, Mr. Tian Yishui from MOA Energy and Environmental Protection Center and Mr. Meng Zhaoli from Qinghua University briefed the participants on the VA design and preliminary achievements made under the UNDP/GEF Chinese TVEs project.

On the morning of the second day, the team leader of the subcontractor for the establishment and capacity building of LPICs gave a report reviewing the implementation of the subcontract. Ms. Zhou Hong, legal expert of the team elaborated on the designing approach of and the revisions made to action plans for the LPICs. Mr. Yuan Hui, deputy director of Dalian TVE Bureau and the director of Dalian LPIC reviewed the establishment of Dalian LPIC, and explained about its action plan and its future work. Mr. Liang Xinbao from the pilot TVE of Moling Metal Casting Factory unveiled the factory's plan for technical upgrading and future development. Mr. Shen Fuqiang, standing vice president of Shenhe Cement Co Ltd also

reported activities they have taken in capacity building, and talked about the development of the company.

During the afternoon session, Ms. Wang Guiling, deputy director of PMO gave a presentation about the PMO's work plan for 2004 and the schedule for the establishment and capacity building of the additional LPICs. Mr. Wang Hai, managing director of Hongyuan Co, talked about the major events to take place in 2004 under the subcontract for sustainable operation of Hongyuan.

Following the presentations, discussions were held among the participants, PMO and PIC staff, CTA and the subcontractors' team on such issues as VA mechanism, LPIC capacity building, sustainability of the project, etc.

III. Discussions and ideas

Mr. Wen Gang from GEF China emphasized that attention be given to market-orientation and commercialization in the process of project implementation.

Mr. Cao Fengzhong from the State Environmental Protection Administration appraised the project well designed, and LPIC mode a good one. It showed the far-sight in designing this energy conservation project with Chinese TVEs 6 years ago.

Professor Meng Zhaoli believed that this project is enjoying an unprecedented environment for implementation. Energy crisis is

emerging in China, and the government is attaching great importance to energy efficiency.

According to the experience of the Jianning LPIC, said Mr. Li Longbao, deputy director of Jiangning TVE Bureau, LPIC establishment and design of action plan should be carried out in conformity with the administrative arrangement of the pilot county. They should be incorporated into the work of the local government. Only in this way will the local authorities be really enthusiastic about the project activities.

IV. Comments and consensus

1. The participants affirmed and praised the subcontractor's job. They agreed that the project is characterized by LPIC, which is combined with VA mechanism to realize the sustainability of the project.
2. PMO, PIC and CTA are satisfied with the training workshop including its organization, implementation and results. TVE representatives found it informative and helpful for them to learn more. They felt enlightened on their future work.
3. TVE representatives realized that under the current situation in China, TVEs have to pay enough attention to environmental protection so as to achieve sustainable growth. The project has given the TVEs a chance for development. They expressed their

commitment to speeding up activities under the project.

4. All participants found the current situation in China is good for project implementation. PMO and PIC called on all LPICs and TVEs to seize the opportunity and take active actions. The subcontractors and Hongyuan are requested to take faster steps to assist LPICs and TVEs in implementing LPIC Statutes, Action Plan and VA, and in finalizing technical upgrading program for full implementation of TVEs' capacity building.

Attachment: Name list of participants

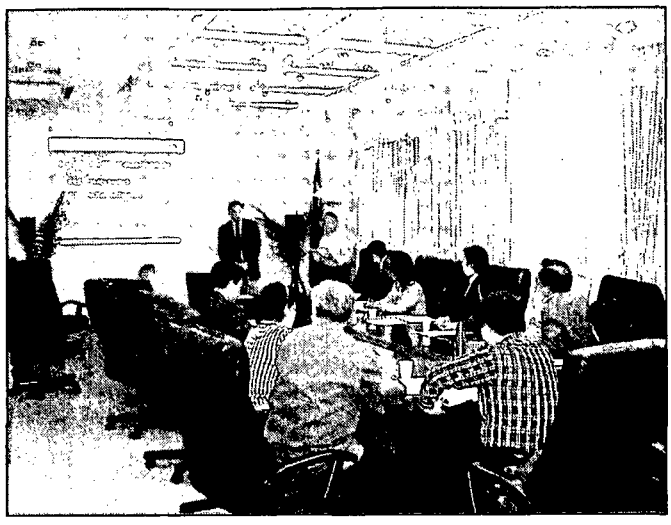
annex

Name list of Participants

Name	Title	Organization/Institution
Ms. Cai Li	Division chief	Industry Guidance Division of BTVE, MOA
Mr. Wang Xiwu	Senior Administrator	PIC secretariat
Ms. Wang Guiling	Deputy Director	GEF Project Office
Mr. Zhang Zhihong	Chief Technical Advisor	UNIDO
Mr. Zheng Ge	Assistant	GEF Project Office
Mr. Cao Fengzhong	Consultant	State Environmental Protection Administration
Mr. Deng Yongzheng	Project Officer	UNDP China Office
Mr. Wen Gang	Project Officer	GEF China Secrateriat
Mr. Wang Xuejun	Professor	College of Environmental Sciences, Peking University
Ms. Jiang Yun	Expert	Chinese Energy Efficiency Association
Ms. Qiao Liming	Expert	World Wildlife Fund, China Office
Ms. Ding Hang	Expert	Zhongjie Blue Sky Investment Management Company
Kornelis Blok	Managing Director	Ecofys
Lynn Price	Researcher	International Energy Studies Group, Lawrence Berkley National Laboratory, USA
Staf Henderieckx	Foundry expert	Gieterij Middelburg
Mr. Wang Hai	General Manager	Hongyuan Company
Mr. Song Dongfeng	Contract Officer	Hongyuan Company
Ms.Shao Chen	Assistant	Hongyuan Company
Ms. Wang Hui	Director	MOA Center for TVEs Development
Mr. Meng Zhaoli	Professor	Tsinghua University
Mr. Tian Yishui	Expert	MOA Center for Energy and Environmental Protection
Ms. Tang Min	Expert	MOA Center for TVEs Development
Ms. Zhou Hong	Expert	MOA Center for TVEs Development

annex

Name	Title	Organization/Institution
Mr. Yuan Hui	Director General	Dalian Bureau of TVEs
Mr.YuDeyan	Plant Manager	Jinmei Casting Pipe Plant, Dalian
Ms. Hu Xuemei		Government Office,Tianshan District, Huangshi City, Hubei Province
Mr. Li Longbao	Director General	Bureau of Small & Medium Enterprises, Jiangning District, Nanjing
Mr. Liang Xinbao	Plant Manager	Nanjing Moling Casting Plant
Mr.Xu Wencheng	Deputy Town Governor	Moling Town, Jiangning District
Mr. Tong Jiazhi	Director	Bureau of TVEs, Xinjin County, Sichuan Province
Mr. Shen Fuqiang	Deputy General Manager	Shenhe Cement Ltd. Co., Zhejiang Province
Mr. Gong Muquan	Plant Manager	Yeyan Brick Plant, Xinjin County, Sichuan Provinec
Ms. Jiang Shujin		Bureau of Small & Medium Enterprises, Xinjin County,Sichuan Province
Mr.Wang Yuman	Director General	Bureau of TVEs, Baqiao District, Xi'an City, Shannxi Province
Mr. Ling Fuhe	Plant Manager	Liucun Brick Plant, Baqiao District, Xi'an
Mr. Luo Ruisheng	Plant Manager	Taiyuan Gangyuan Coking Company
Mr. Bai Guodong		Bureau of development and Design , Qingxu City,shanxi Province
Mr. Pang Bushe		Bureau of development and Design , Qingxu City,shanxi Province
Mr. Gao Guodong	Section Chief	Industry Guidance Section, Bureau of TVEs, Fangshan District, Beijing
Mr. Li Shi	Plant Manager	Beijing Yancun Brick Plant



Public Seminar on
Energy and Climate Change Policies in Europe and the United States
March 29, 2004

Workshop on Energy Efficiency Voluntary Agreements
March 30, 2004

Discussions about the establishment and capacity building of LPICs
March 31, 2004

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annex 9.8.1

欧盟能源与气候政策的新进展
New Developments in Energy and Climate Policy in the European Union

2003年3月29日

Kornelis Blok

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政策的三个方面：
Three areas of policies:

1. 欧盟独享的权限
   Exclusive competence of the Union
2. 欧盟和各成员国共享的权限
   Shared competence between Union and member states
3. 欧盟的支持、协调和辅助作用
   Union can support, co-ordinate, supplement, etc. etc.

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欧洲政治的重大进展
Important political developments in Europe

十个新成员国　Ten new members

欧洲会议　The European Convention

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在能源及环保领域共享的权限
Shared competence:
a.o. for energy and environment

.....在此领域，欧盟及其成员国有权进行立法并制定相应的法案。
the Union and the Member States shall have the power to legislate and adopt legally binding acts in that area.

成员国可以行使欧盟尚未行使或已决定停止行使的权限
The Member States shall exercise their competence to the extent that the Union has not exercised or has decided to cease exercising, its competence.

引自2003年6月20日于布鲁塞尔制订欧洲宪法的条约草案，CONV 820/03
Draft Treaty Establishing a Constitution for Europe, CONV 820/03, Brussels, 20 June 2003

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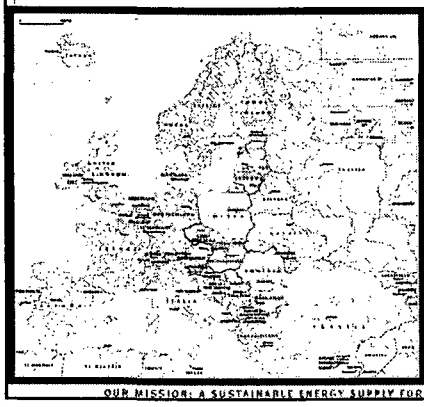

将于2004年加入欧盟的十个国家
Ten new countries will join the European Union in 2004

欧盟国家总数将达25个
Total number of countries will be 25

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近年来欧盟能源政策得以强化
Strengthening of EU Energy Policies in recent years

可再生电力指令 The renewable electricity directive
生物燃料指令 The biofuels directive

热电联产指令　Cogeneration directive

欧洲汽车制造商联合会关于客车**CO2** 排放的协议
The ACEA agreement on CO_2 emissions of passenger cars

建筑物效能指令 The Energy Performance of Buildings directive

排放贸易简介　**Introduction of emission trading**

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何谓"指令" What is a "directive"

- 指令是欧盟立法的一个组成部分
  A directive is a piece of joint European Union legislation
- 经以下各方达成一致意见 Agreed upon by
  - 欧洲委员会（欧盟董事会）
    the European Commission (board of Union)
  - 欧洲议会 the European Parliamant
  - 部长联席会议（代表各国政府）
    Council of Ministers (= national governments)
- 需要各成员国通过在本国立法，贯彻落实
  Needs to be implemented by the Member States in national legislation

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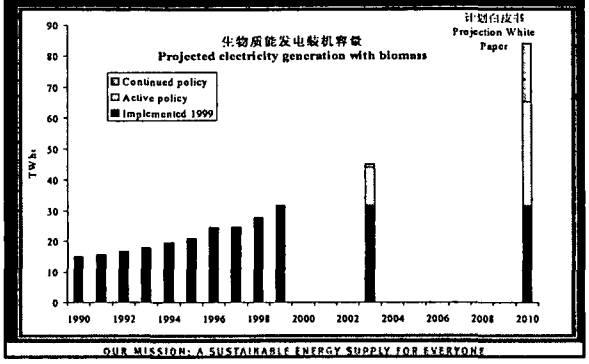
生物发电 Biomass electricity generation



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可再生电力指令
The Renewable Electricity Directive

- **2010年22%的电力来自于可再生能源**
  22% of electricity from renewables in 2010
- 各国的指示性目标（指标）
  National indicative targets
- 可再生能源发电并网准入
  Grid access for renewables
- 原产保证（绿色证书）
  Guarantee of origin (green certificates)

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Belgium比利时	1%	6%	1%	3%
Germany德国	6%	13%	11%	12%
Denmark丹麦	13%	29%	23%	42%
Spain西班牙	19%	29%	22%	30%
Finland芬兰	26%	32%	31%	31%
France法国	15%	21%	13%	16%
Greece希腊	10%	20%	12%	15%
Ireland爱尔兰	5%	13%	11%	15%
Italy意大利	17%	25%	17%	18%
Luxemburg卢森堡	3%	6%	5%	9%
Netherlands荷兰	2%	9%	6%	9%
Portugal葡萄牙	36%	39%	27%	38%
Sweden瑞典	50%	60%	57%	57%
United Kingdom	2%	10%	4%	4%
EU-15欧盟15国	14%	22%	15%	18%

绿色：达标 Green: target is met
红色：未达标 Red: target is not met

2010 2010 2010
Active P Continued Indicative Target

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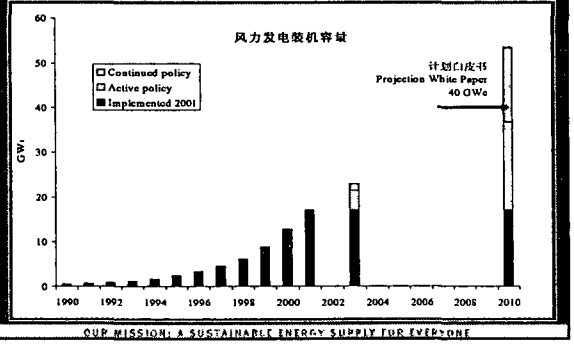
风力发电 Wind electricity production



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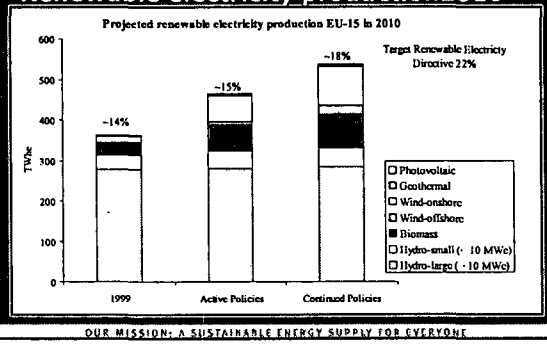
2010年可再生能源发电量
Renewable electricity production2010



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生物燃料指令 The Biofuels directive

- 2005年，所有汽车燃料的2%应为生物燃料
  In 2005: 2% of all automotive fuels should be biofuels
- 2010年，所有汽车燃料的5.75%应为生物燃料
  In 2010: 5.75%
- 最有可能使用乙醇和生物柴油
  Most likely ethanol and biodiesel
- 对生物燃料实行免税将是重要的政策工具
  Tax exemption for biofuels will be an important policy instrument

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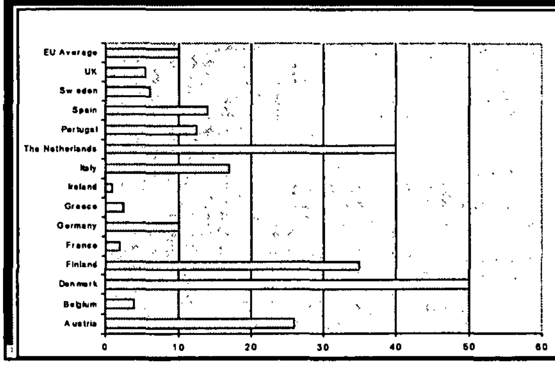
production 1999



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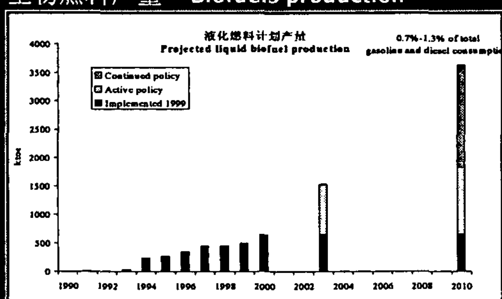
生物燃料产量 Biofuels production



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热电联产指令 Cogeneration directive

- 促进高效热电联产的实施（即：节省电10%以上）
  Promote the implementation of high efficiency cogeneration (i.e. more then 10% savings on electricity)
- 热电联产（CHP）发电原产保证体系
  Systems for guarantee of origin for electricity from CHP
- 并网准入的公平条件
  Fair conditions for grid access
- 对高效CHP的潜力进行国家级分析，并须由此产生新的措施
  National analysis of potentials for high efficiency CHP; this must lead to new initiatives

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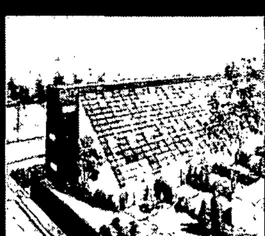
建筑物能源效能指令 Directive on the Energy Performance of Buildings

Member States should have:



- 订有新建筑物的能效标准；同时适用于1000平方米以上现有建筑物的翻修 Energy performance standards for new buildings; also for existing buildings larger than 1000 m² when renovated
- 为1000 m²以上建筑物考虑配备热电联产、热泵等设备
  Consider CHP, heat pumps etc. for buildings larger than 1000 m²
- 为修建、出租或出售的建筑物颁发能效证书 Energy performance certificate of buildings when built, hired out or sold
- 对大于20千瓦的锅炉进行定期检查
  Regular inspection of boilers more

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与汽车制造商的协议 Agreement with car manufacturers

- 欧洲委员会和欧洲汽车制造商（ACEA)间签署的协议
  Agreement between European Commission and association of European car manufacturers (ACEA)
- 2008年，欧洲汽车制造商售出汽车的CO_2平均排放量应低于140克CO_2/公里
  In the year 2008 cars sold by European car manufacturers should <u>on average</u> have an emission of less 140 g CO_2 per km
- 日本和韩国汽车制造商2009年的目标与此相同
  Japanese and Korean car manufacturers: same target for 2009

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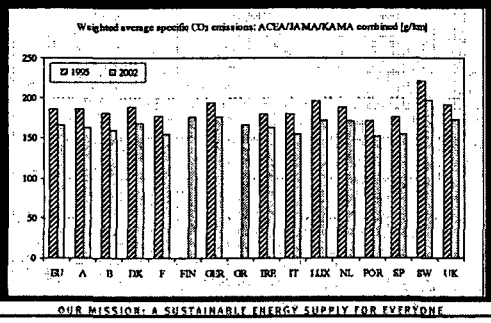
与汽车制造商协议的实施结果
Results of agreement with car manufacturers



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欧盟排放贸易体系（ETS）
The European Union Emission Trading System (ETS)

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将要发布的指令：Upcoming:

- 生态设计指令：**Eco-design directive:**
  对耗能设备效率的框架指令
  Framework directive for the efficiency of energy-using equipment

- 能源服务指令：**Energy services directive:**
  成员国有义务以每年1% 的速率提高能效
  obligation for Member States to increase rate of energy efficiency improvement by 1% per year

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欧盟排放贸易体系：**1-1-05**
EU Emissions trading system: 1-1-05

- European Parliament adopted Directive introducing:
- A mandatory cap & trade system for GHGs
  - Companies need emission permit (non-tradable)
  - Companies with permit receive tradable allowances
- Two periods
  - 2005 - 2007
  - 2008 - 2012 (first budget period Kyoto-protocol)
- Start with CO_2 only (opt-in non-CO_2 from 2008)

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工业节能自愿协议
Voluntary agreements on industrial energy efficiency

- 荷兰 The Netherlands
  - 1990 – 2000: long-term agreements
  - 2000 – 2012: benchmarking agreement (large energy users)
  - 2000 – 2010: 2nd generation long-term agreements (small users)
- 丹麦：避免碳税 Denmark: to avoid carbon tax
- 德国：行业单方面宣言 Germany: unilateral declaration by industry
- 法国、芬兰、英国 France, Finland, United Kingdom, ...

- 欧洲关于"环境协议"的指导方针：1996，2002
  European guidelines on "Environmental Agreements": 1996, 2002
- 欧盟没有统一的协议 No common European Union agreements

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排放贸易可以节约成本
Possible cost savings from ET

- 在欧盟内达到京都议定书目标
  Meeting Kyoto objectives in the EU
  - 不实施排放贸易 without trading: **42** euro/t CO_2
  - 实施排放贸易 with trading: **20** euro/t CO_2

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排放贸易参与单位
Emissions trading participants

- 炼油厂、焦炉、钢铁厂、水泥厂、玻璃厂、陶瓷厂、造纸厂
  Refineries, cokes, iron&steel, cement, glass, ceramics, pulp & paper
- 所有大于20兆瓦的大型燃烧设备（包括电力行业）
  All large combustion installations larger than 20 MW_{th} (includes electricity sector)
- 约12000家参与单位 About 12,000 participants
- 与第三国的联系：Linkage to third countries
  - 新成员国 New member states
  - 挪威、瑞士、冰岛：Norway, Switzerland, Iceland (EEA)?
  - 加拿大、日本？ Canada, Japan?

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对不达标的罚款 Penalties for non-compliance

- 2005-2007: 40 € /吨 CO_2-当量
- 2008-2012: 100 € /吨 CO_2-当量

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排放指标的分配 Emissions allocation

- 第一阶段（05年－07年）至少95%免费
  At least 95% free of charge in 1st period (05-07)
- 第二阶段（08年－12年）至少90%免费，即10%可以拍卖
  At least 90% free of charge in 2nd period (08-12) thus possible auction up to 10%
- 根据所谓的附件三的标准进行分配
  Allocation according to criteria in so-called Annex III

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关联指令（草案）The Linking Directive (DRAFT)

- 关联指令将排放贸易体系与清洁发展机制（CDM）以及联合实施（JI）相结合
  Linking directive links the Emission Trading System to the Clean Development Mechanism (CDM) and Joint Implementation (JI)
- 在排放贸易系统下，经认证的减排量可转换成允许的排放
  Certified Emission Reductions can be converted to Emission Allowances under the Emission Trading System
- 有效期于2008年 Valid as of 2008
- 排放总额最高达6% Maximum 6% of total allowances
- 造林项目无效 Credits from forestation not acceptable

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分配标准（附件三）
Allocation criteria (Annex III)

- 排放总额应与国家目标和国家政策相一致
  Total quantity of allowances should be consistent with national target and national policies (#1)
- 不得超过允许（国家援助）
  No 'over-allocation' (State Aid Guidelines!) (#2)
- 排放总额应与通过减排潜力估算一致
  Quantity of allowances should be consistent with reduction potential of activities (#3)
- 不得扭曲国内市场 No distortion of the internal market (#5)
- 明确对"早行动"和新入市者的处理方法
  Indicate way of dealing with 'early action' and new entrants(#6,7)
- 列明涉及的装置及每年装置的排放
  Include list of installations covered and allowances per installation (#8a)

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欧盟排放贸易议程
EU Emissions Trading Agenda

欧盟议会通过	Adoption Parliament	2003年7月
欧盟委员会最终表决	Final Council decision	2003年9月
其他指令	Additional Directives;	2003年秋
– 结合JI/CDM的项目	Linking JI/CDM projects	
– 排放监控	Monitoring Emissions	
– 温室气体登记	GHG Registries	
国家分配计划	National allocation plans	2004年3月
委员会批准/提出意见	Approval/Comments EC	2004年6月
修改行业/气体	Amendment sector/gases	2004年12月

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annex 9.8.2

美国温室气体减排自愿举措
Voluntary Greenhouse Gas Mitigation Efforts in the U.S.

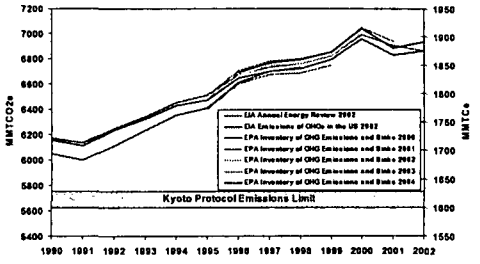
Lynn Price
Energy Analysis Department
Environmental Energy Technologies Division
Lawrence Berkeley National Laboratory

Presented at the Workshop on Energy Efficiency Voluntary Agreements

March 30, 2004

1

美国温室气体排放 1990－2002年
U.S. GHG Emissions 1990-2002



4

劳伦斯伯克利国家实验室
Lawrence Berkeley National Laboratory

加州大学下属的美国能源研究实验室
U.S. Department of Energy research laboratory
Managed by the University of California

4000名员工	4000 emp
– 200名加州大学教员	200 UC fac
– 600名研究生	600 gradu
– 90名博士后	90 post do
– 若干来自国外的访问学者	many visiti
9名诺贝尔奖获得者	9 Nobel Laure

环境能源技术处：从事研究与开发以改善
来的对环境的负面影响

Environmental Energy Technologies Division: Mission is to perform research and development leading to better energy technologies and reduction of adverse energy-related environmental impacts

2

美国气候变化政策：现状
U.S. Climate Change Policy: Current Status

- 2002年，总统布什先生承诺在未来十年内实现温室气体排放强度降低18%的目标（温室气体强度是指 每百万美元国内生产总值的温室气体排放量）
- 2002, President Bush committed the US to a goal of reducing domestic GHG emissions by cutting its GHG intensity – how much it emits per unit of economic activity – by 18% over the next 10 years.
- 政策支持开展气候变化方面的研究，通过给予这些科学研究和技术开发提供资金支持为将来的行为奠定基础
- The policy also supports climate change research, laying the groundwork for future action by investing in science, technology, and institutions.
- 政策强调国际合作，促进与它国携手，努力寻求协调有效的应对之策
- The strategy emphasizes international cooperation and promotes working with other nations to develop an efficient and coordinated response to global climate change.

5

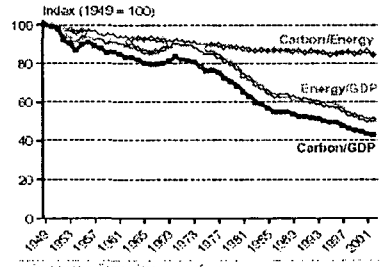
美国气候变化政策：历史回顾
U.S. Climate Change Policy: History

- 1992年：签署并批准联合国气候变化框架公约
- 1992: signed and ratified the UN Framework Convention on Climate Change
- 1998年：美国签署京都议定书
- 1998, U.S. signed the Kyoto Protocol
- 2001年，美国总统布什宣布他不会将京都议定书提交参议院审批，因为议定书规定世界上80%的人口，包括人口大国：中国和印度不需要承担CO_2减排任务，这将严重损害美国的经济。
- 2001: President Bush declared that he will not submit the Protocol to the Senate for ratification because "it exempts 80 percent of the world, including major population centers such as China and India, from compliance, and would cause serious harm to the U.S. economy"

3

美国温室气体强度历年走势
Historical U.S. GHG Intensity Trends

Intensity Ratios: Carbon/GDP, Carbon/Energy, and Energy/GDP



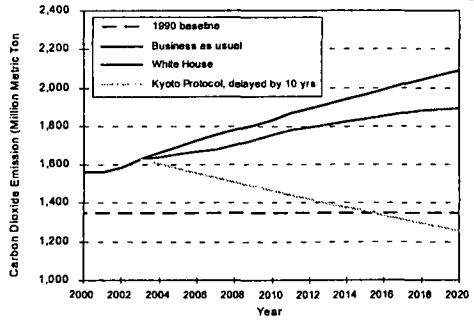
Between 1990 and 2000 the overall change in GHG intensity (carbon/GDP) was -17.9%

1990至2000年，温室气体排放强度的总变化是 -17.9%

Source: U.S. Energy Information Administration

6

美国气候变化政策
U.S. Climate Change Policy: ACEEE Critique



7

美国能效政策
U.S. Energy Efficiency Policy

- 总统颁布的行政指令 National Executive Orders (issued by the President)
  - 要求各部门购买节能计算机设备 Requiring Agencies to Purchase Energy Efficient Computer Equipment
  - 联邦政府机构采取能效和节水措施 Energy Efficiency and Water Conservation at Federal Facilities
  - 通过能效管理办法，使政府办公"绿色化" Greening the Government Through Efficient Energy Management
  - 开发和推广生物产品和生物能 Developing and Promoting Biobased Products and Bioenergy
  - 高效率促进政府办公"绿色化" Greening the Government Through Federal Fleet Transportation Efficiency
  - 采取行动加快能源项目的实施 Actions To Expedite Energy-Related Projects
  - 节能式备用发电装置 Energy Efficient Standby Power Devices

10

气候管理条例（麦肯-利伯曼）
Climate Stewardship Act (McCain-Lieberman)

- 制定一个温室气体排放限度，通过减排贸易得以实施，并开始于2010年
- Would establish a limit on GHG emissions, implemented through an emissions-trading program, beginning in 2010
  - 2010年至2016年，温室气体年排放量限制在2000年的排放量
  - 2010 to 2016: annual GHG emissions limited to the amount released in 2000
  - 2016年后：限制在1990年的排放水平
  - After 2016: limit reduced to the 1990 emissions levels.
- 将覆盖美国所有二氧化碳和工业温室气体排放量的70%以上（不包括住宅和农业所产生的排放量）
- Would cover more than 70% of all U.S. CO2 and industrial GHG emissions (excludes residential and agricultural emissions).
- 比京都议定书宽松，比现行政策强硬
- Weaker than the Kyoto Protocol, stronger than the current policy
- 在2003年10月的参议院投票表决中未通过（44%支持，56%反对）－不久将进行再次表决。
- Lost in Senate vote (44% for, 56% against) October 2003 – will be voted on again soon

8

美国能效政策
U.S. Energy Efficiency Policy

- 能源政策法－1992 Energy Policy Act (EPAct) – 1992
  - 在美国能源部开展可再生新能源及节能技术的示范活动，并推进其商业化
  - Established a program within the U.S. Department of Energy to demonstrate and commercialize new renewable energy and energy efficiency technologies
  - 制定新标准、评级体系和示范方案，不断提高建筑物节能水平
  - Established new standards, rating systems and demonstration programs to promote increased energy efficiency in buildings
  - 制定自愿方针，为工业部门的节能改造提供赠款
  - Outlined voluntary guidelines and provided grants to industry for energy efficiency improvements
  - 制定电器、设备的新标准和标识方案
  - Outlined new standards and labeling programs for appliances and equipment

11

美国能效政策
U.S. Energy Efficiency Policy

- 国家能源政策法规（经国会批准通过）
- National Energy Policy Legislation (passed by Congress)
  - 国家能效与政策法－1975
  - National Energy Conservation and Policy Act – 1975
  - 国家能源法－1978
  - National Energy Act – 1978
  - 美国家电节能法- 1987
  - National Appliance Energy Conservation Act – 1987
  - 能源政策法－1992
  - Energy Policy Act – 1992

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U.S. Energy Efficiency Policy
美国能效政策

- 能源政策法－1992
- Energy Policy Act (EPAct) – 1992
  - 在投资电厂决策时，指导全有电力部门充分利用综合资源规划
  - Directed all utilities to use integrated resource planning in making power plant investment decisions
  - 为国家和地方节能项目提供贷款和培训
  - Provided loans and training for state and local energy conservation programs
  - 设定目标和要求以促进用于联邦建筑物的节能措施的实施
  - Set goals and requirements to stimulate implementation of conservation measures in federal buildings
  - 批准追加用于节能研究、开发和示范的开支。
  - Authorized increased spending for energy efficiency research, development, and demonstration

12

美国能源部
U.S. Department of Energy

- 建立于1977年 Founded in 1977
- 促进美国的国家安全、经济和能源安全，并支持为此而开展的科学、技术革新活动
- Mission is to advance the national, economic and energy security of the U.S. and to promote scientific and technological innovation in support of that mission
- 与气候变化相关的活动：
- Climate change related activities:
  - 温室气体的自愿报告体系（1605b）
  - Voluntary Reporting of Greenhouse Gases (1605b)
  - 气候变化展望
  - ClimateVISION
  - 气候变化技术项目
  - Climate Change Technology Program
  - 与新一代核电站、碳封存和氢能相关的研发活动
  - Research and development related to next generation nuclear facilities, carbon sequestration, and hydrogen

13

美国温室气体自愿方案：气候展望
U.S. Voluntary GHG Programs: Climate VISION

- 工业行业目标： Industrial Sector Goals:：
  - 波特兰水泥协会（PCA）承诺截至2020年每吨水泥在1990年排放水平上减排CO2 10%
  - Portland Cement Association (PCA) has committed to reduce CO2 emissions by 10% per ton of cement from a 1990 baseline by 2020.。
  - 美国钢铁协会（AISI)承诺截至2012年全行业平均能效比1998年提高10%
  - American Iron and Steel Institute (AISI) has committed to achieving a 10% increase in sector-wide average energy efficiency by 2012 from 1998 levels.
  - 半导体行业协会（SIA)承诺大力减少温室气体排放，到2010年底，在1995年基础上减少10%
  - Semiconductor Industry Association (SIA) has committed to reduce a suite of the most potent GHG emissions by 10% from 1995 levels by the end of 2010.

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美国温室气体排放的自愿报告体系
U.S. Voluntary Reporting of Greenhouse Gas Emissions

- 根据1992年的国家能源政策法的1605（b）节所设立，报告开始于1995年
- Established by Section 1605(b) of the 1992 National Energy Policy Act, reporting began in 1995
- 参与"气候挑战"项目的电力部门，与诸多制造商和其它实体一起，报告年度温室气体排放总量，或者报告实施温室气体减排项目的节能量
- Utilities in the Climate Challenge program, along with manufacturers and other entities, report either total annual GHG emissions or savings from GHG emissions reduction projects
- 2002年报告： 2002 report:
  - 228家公司和其它组织进行了报告
  - 228 companies and other organizations reported
  - 开展了2027个项目减少或封存温室气体的排放
  - 2027 projects to reduce or sequester GHG emissions
    - 直接减排量达265 MMTCO2e direct reductions
    - 其它方式减排量达93 MMTCO2e other reductions

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美国温室气体自愿方案：气候展望
U.S. Voluntary GHG Programs: Climate VISION

- 工业界目标： Industrial Sector Goals:
  - 镁联盟与国际镁协会：成员公司承诺2010年之前消除镁生产过程中SF6的排放。
  - Magnesium Coalition and the International Magnesium Association. Partner companies have committed to eliminate sulfur hexafluoride (SF6) emissions from their magnesium operations by 2010.
  - 美国化学委员会（ACC)：同意截止2012年温室气体总强度比1990年降低18%
  - American Chemistry Council (ACC) has agreed to an overall greenhouse gas intensity reduction target of 18% by 2012 from 1990 levels.
  - 铝协会：承诺在全行业范围内降低温室气体排放量
  - Aluminum Association has committed to reduce sector-wide greenhouse gas emissions

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美国温室气体自愿方案：气候展望
U.S. Voluntary GHG Programs: Climate VISION

- 气候展望（自愿式、创新式行业行为：目前大有可为）
- Climate VISION (Voluntary Innovative Sector Initiatives: Opportunities Now)
- 于2003年2月宣布
- Announced February 2003
- 承诺在未来十年内实现温室气体排放强度（温室气体排放量与经济产值的比值）降低18%
- Committed to reducing America's greenhouse gas intensity - the ratio of emissions to economic output - by 18 percent during the next decade
- 向美国商业和工业界提出挑战，促使其进一步努力实现以上目标
- Challenged American businesses and industries to undertake broader efforts to help meet that goal
- 被非政府组织批评为仍然采用常规手段
- Criticized as "business-as-usual" by non-governmental organizations

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美国温室气体自愿方案：气候展望
U.S. Voluntary GHG Programs: Climate VISION

- 工业行业目标： Industrial Sector Goals:
  - 汽车制造商联盟承诺：到2012年，其美国本土汽车制造厂生产过程中的温室气体排放比基准2002年下降至少10%
  - The Alliance of Automobile Manufacturers member companies commit to achieve at least a 10% reduction in GHG emissions from their U.S. automotive manufacturing facilities, based on U.S. vehicle production, by 2012 from a base year of 2002.
  - 美国森林与纸业协会（AF&PA)承诺采取行动，到2012年,温室气体强度比2000年降低12%
  - American Forest and Paper Association (AF&PA) is committed to actions to to reduce their greenhouse gas intensity by 12% by 2012 relative to 2000.

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美国环保署
U.S. Environmental Protection Agency

- 成立于1970年
- Founded 1970
- 美国环保署旨在保护人类健康，维护人类赖以生存的自然环境—空气、水和陆地。
- The mission of the U.S. Environmental Protection Agency is to protect human health and to safeguard the natural environment–air, water, and land–upon which life depends
- 与气候变化相关的活动：Climate change related activities:
  - 能源之星 Energy Star
  - 气候先锋 Climate Leaders
  - 引起全球气候变暖的高潜在性气体 High Global Warming Potential Gases
  - 美国温室气体年鉴 Annual U.S. Greenhouse Gas Inventory

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美国环保署：HGWP项目
U.S. Environmental Protection Agency: High GWPs

- HGWP环境管理项目－铝、镁、半导体、HCFC-22和输配电行业间的合作项目，致力于降低HFC、PFC和SF6的排放
- High GWP Environmental Stewardship Program - Partnership programs in the aluminum, magnesium, semiconductor, HCFC-22, and electric power transmission and distribution sectors to reduce HFC, PFC, and SF_6 emissions
- 铝行业自愿合作关系－参与的企业与国家环保署合作提高铝生产效率同时降低PFC排放
- Voluntary Aluminum Industrial Partnership - Participating companies work with EPA to improve aluminum production efficiency while reducing perfluorocarbon (PFC) emissions

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美国环保署：能源之星
U.S. Environmental Protection Agency: Energy Star

- "能源之星"是为建筑物、设备和工业领域设计的项目
- Energy Star program for Buildings, Equipment, and Industry
- 旨在建立工业企业与政府间的合作关系
- Develops partnerships between industries and government
- 有500多个工业合作伙伴参与的自愿项目
- Voluntary program with over 500 industrial partners
- "能源之星"为行业提供指导
- Energy Star guides for industry
- 已接受评估的行业包括： Industries evaluated include:
  - 汽车装配 Automobile assembly
  - 水泥 Cement
  - 玉米精炼 Corn refining
  - 酿造 Brewing
  - 石油炼制 Petroleum refining
  - 制药 Pharmaceuticals

Money Isn't All You're Saving

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美国环保署
U.S. Environmental Protection Agency

National Environmental PerformanceTrack

- 国家环境效能追踪项目认可并鼓励美国300多家私有和公有企业的最佳环保绩效
- The National Environmental Performance Track Program recognizes and encourages top environmental performance among over 300 private and public facilities in the United States
- 效能追踪项目通过表彰、灵活监管以及其它激励措施，促进高水平的环保绩效，并为相互学习最佳实践提供网络平台。
- Performance Track provides recognition, regulatory flexibility, and other incentives that promote high levels of environmental performance and provides a learning network where best practices can be shared

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美国环保署：气候先锋
U.S. Environmental Protection Agency: Climate Leaders

"气候先锋"自愿同意：
Climate Leaders voluntarily agree to:

- 完成一份年度温室气体名录
- Complete an annual GHG Inventory
- 设定积极的五至十年减排目标
- Set 5 - 10 year aggressive emissions reduction goal

五十四家公司已加入"气候先锋"项目
54 Companies have joined Climate Leaders
二十一家已设定减排目标
21 have set emissions reduction goals

CLIMATE LEADERS
U.S. Environmental Protection Agency

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美国节能与温室气体减排
Energy Efficiency and GHG Mitigation in U.S. States

- 美国各州可以实施各自的节能与温室气体政策
- States can implement their own energy efficiency and greenhouse gas mitigation policies
- 用于节能的联邦投资目前是州政府投资的60%。州政府2003年投资约为十五亿。
- Federal funding for energy efficiency is now 60% of state funding. State funding in 2003 was almost $1.5B
- 一些州已经实施在联邦层面上有争议的政策和方案，例如可再生组合标准和温室气体排放强制公报制度
- Policies and programs that are controversial at the federal level, such as renewable portfolio standards and mandatory reporting of greenhouse gas emissions, have been implemented in a number of states.

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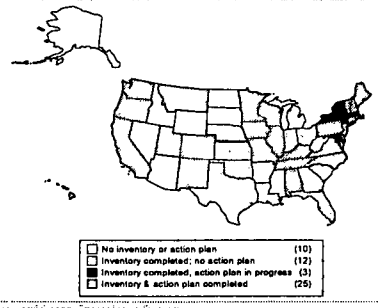
美国节能与温室气体减排
Energy Efficiency and GHG Mitigation in U.S. States



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加州气候行动登记处
California Climate Action Registry

- The Registry's purpose is to help companies and organizations with operations in California to 登记处的目的在于帮助加州的公司和组织
  - 编制名录并报告其温室气体排放量
  - inventory and report their GHG emissions
  - 设定温室气体排放基准线，未来任何温室气体排放要求将按此基准线制订
  - establish GHG emissions baselines against which any future GHG emission reduction requirements may be applied
- 加州承诺：如果将来出台州、联邦或国际性温室气体监管措施，将适当考虑首先保护登记在册的单位
- State of California promises to ensure that participants receive appropriate consideration for early actions in the event of any future state, federal or international GHG regulatory scheme.
- 参与登记的部门包括商店、非盈利组织、市政府、州属机构和其它部门
- Registry participants include businesses, non-profit organizations, municipalities, state agencies, and other entities.

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新英格兰州和东加拿大州
New England Governors and Eastern Canadian Premiers

- 2001年采纳气候变化行动计划
- 2001 adopted Climate Change Action Plan
- 目标：Goals:
  - 短期：到2010年将区域温室气体排放降低到1990年水平。
  - Short-term: Reduce regional GHG emissions to 1990 emissions by 2010.
  - 中期：到2020年将区域温室气体排放量降低到比1990年低至少10%的水平。
  - Mid-term: Reduce regional GHG emissions by at least 10% below 1990 emissions by 2020.
  - 长期：将区域温室气体排放量充分降低到其对气候不造成任何危害，目前科学表明要比目前水平下降75-85%
  - Long-term: Reduce regional GHG emissions sufficiently to eliminate any dangerous threat to the climate; current science suggests this will require reductions of 75–85% below current levels.
  - 制定一份区域排放名录　Development of a regional emissions inventory
- 确立能够快速实施且成本经济的改善气候的起步措施，为赢得采取更多措施所需的支持奠定基础。
- Identification of initial climate actions that could be implemented quickly, cost-effectively and serve as a foundation for building widespread support for additional actions

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美国各州节能与温室气体减排
Energy Efficiency and GHG Mitigation in U.S. States

- 加州：到2005年，必须采用有关标准，在兼顾环保、社会、技术和经济因素的同时，最大限度地使机动车辆温室气体排放具有可行性和成本效益
- California: Standards that will achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles," taking into account environmental, social, technological, and economic factors must be adopted by 2005.
- 康涅狄格州：采取38项气候措施使该州温室气体排放量在2010年减少 407万公吨或比预计水平下降8.5%
- Connecticut: Adopted 38 climate measures to reduce the state's GHG emissions by 4.07 million metric tons, or 8.5%, below projected levels in 2010.
- 新泽西州：与公有、私有行业签署温室气体减排协议，根据本州的减排目标力争在2005前温室气体排放比1990年减少3.5%
- New Jersey: GHG emissions reduction covenants signed with public and private sectors to reduce greenhouse gas emissions by 3.5 percent from 1990 levels by 2005 in accordance with the state reduction goal

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美国节能与温室气体减排：加州
Energy Efficiency and GHG Mitigation in U.S. States : California

加州能源委员会(CEC) 是负责气候变化问题的领导机构

The California Energy Commission (CEC) is the lead agency for climate change issues

- 加州能源委员会有一个大型的气候变化项目（CCP）
- The CEC has a large Climate Change Program (CCP)
- 加州能源委员会制定加州温室气体排放名录
- The CEC prepares the California inventory of GHG emissions
- CCP在公报和认证协议方面为加州气候行动登记处提供指南 — 一个登记温室气体排放的自愿组织
- The CCP provides guidance on reporting and certification protocols to the California Climate Action Registry, a voluntary registry of GHG emissions
- 加州能源委员会管理公共利益能源研究项目（PIER）：该项目为许多与能源相关的领域所开展的研究提供资助。
- The CEC administers the Public Interest Energy Research (PIER) Program, which funds research in many energy-related areas.
- 加州能源委员会促进在建筑物标准、农业、制造业和水系方面开展节能
- The CEC promotes energy efficiency in building standards, agriculture, manufacturing, and water systems

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美国各州的可再生能源
Renewable Energy in U.S. States

- 加州：电力部门必须按每年1%的速度增加可再生能源销售，直到20%。
- California: Utilities must increase their sales of renewable energy by 1% per year until they reach 20%
- 马萨诸塞州：2009年前电力销售中的4%必须来自可再生能源，每年增加1%直到马萨诸塞州能源资源处确定一个最终日期
- Massachusetts: 4% of electricity sales must be from renewables by 2009, increasing 1% per year until the Massachusetts Division of Energy Resources sets an end date
- 内华达州：所需的可再生能源百分比到2005年增加至7%，2007年为9%，2009年为11%，2011年为13%，2013年为15%
- Nevada: The percentage of renewables required rises to 7% in 2005, 9% in 2007, 11% in 2009, 13% in 2011, and 15% in 2013
- 德克萨斯州：到2009年，所需可再生电力达到2000兆瓦，或德州发电能力的约3%
- Texas: 2000 megawatts, or about 3% of Texas's generating capacity, of renewable electricity required by 2009.

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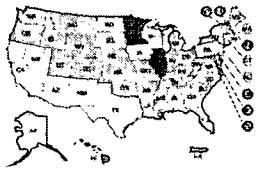
美国各州的可再生能源
Renewable Energy in U.S. States

- 33个州的500多个电力部门为其客户提供可再生电力
- More than 500 utilities in 33 states offer their customers the choice of renewable electricity
- 15个州已设立清洁能源基金以支持可再生能源市场的发展，1998年至2012年间用于可再生能源项目的基金将接近三十五亿
- 15 states have established clean energy funds to help support growth of renewable energy markets - such funds will invest nearly $3.5 billion from 1998 to 2012 for renewable energy projects
- 12个州已制订了可再生能源方案标准
- 12 states have Renewable Portfolio Standards

芝加哥气候交易
Chicago Climate Exchange (CCX)

- 芝加哥气候交易（CCX）是一个有关温室气体的排放贸易方案
- Chicago Climate Exchange,® Inc. (CCX®) is a GHG trading program
  - 世界上第一个进行温室气体减排贸易的多国、多行业交易市场
  - the world's first multi-national and multi-sector marketplace for reducing and trading greenhouse gas emissions
  - 北美有代表性的公司、城市和其它机构首次既有自愿性质又有法律约束力的承诺，共同建立有规可依的温室气体减排市场。
  - the first voluntary, legally-binding commitment by a cross-section of North American corporations, municipalities and other institutions to establish a rules-based market for reducing GHGs
- CCX包括一个温室气体登记和电子贸易平台
- CCX includes a GHG Registry and electronic trading platform
- 2003年9月达成第一笔交易
- 1st trade was September 2003
- 目前交易价格约为每吨CO_2一美元
- Trading currently around $1/t CO2

Renewable Energy in U.S. States
美国各州的可再生能源



□ -黄色表示该州已制订可再生能源方案标准　States that have a Renewable Portfolio Standard (RPS)
■-红色表示该州有可再生能源自愿实施目标，或者有RPS立法但无执行规定　States that have voluntary renewable energy goals or RPS-type legislation without enforcement provisions
□-绿色表示该州没有RPS或有关可再生能源目标方面的政策　States that do not have RPS or renewable energy goal policies.

Source: REPP (www.repp.org)

气候行动合作伙伴
Partnership for Climate Action

PCA Partnership for Climate Action

- 气候行动合作伙伴（环境防御）由八个公司组成，致力于保护气候和限制、降低其温室气体排放
- Partnership for Climate Action (Environmental Defense) is made up of 8 companies dedicated to climate protection and to limiting and reducing their GHG emissions
- Each company commits to: 每个公司承诺：
  - 公开宣布一个全球温室气体排放限度，通过管理行动及必要的政策和激励机制来实现这一目标　Publicly declare a global GHG emissions limit backed by the management action, policies and incentives necessary to achieve that limit;
  - 衡量、追踪、公开报告温室气体净排放量　Measure, track and publicly report net GHG emissions
  - 使用创新策略并交流有关努力减排温室气体方面的经验　To employ innovative strategies and share experiences related to efforts to reduce GHG emissions
  - 这八家公司为：Alcan, BP, DuPont, Entergy, Environmental Defense, Ontario Power, Shell, Suncor Energy

美国城市及各县的节能和温室气体减排情况
Energy Efficiency GHG Mitigation in U.S. Cities and Counties

- 美国140多个城市和县参与了"气候保护城市"项目—这是地方环保活动国际理事会开展的全球性运动
- Over 140 cities and counties in the United States participate in Cities for Climate Protection - a global campaign of the International Council for Local Environmental Initiatives (ICLEI)
- 2003年，155名市长代表近五千万人口发表了一份得到两党支持的"全球变暖市长宣言"，号召联邦政府共同努力，降低全球变暖对人类的威胁
- In 2003, 155 mayors of communities representing almost 50 million people issued a bi-partisan "Mayors' Statement on Global Warming," calling on the federal government to join their cities' efforts to reduce the threat of global warming

PEW企业环保领先理事会
PEW Business Environmental Leadership Council

- 38家商业企业确定温室气体减排目标并一致同意
- 38 member businesses set GHG emissions reduction goals and agree that:
  - 目前，商业企业能够并只应该在美国国内外采取具体措施对减排的机会进行评估，制定和完成减排目标，为更有效的新产品、新办法和技术提供投资
  - businesses can and should take concrete steps now in the U.S. and abroad to assess opportunities for emission reductions, establish and meet emission reduction objectives, and invest in new, more efficient products, practices and technologies .
  - 京都协议在国际进程中迈出了第一步，但是，要贯彻京都会议原则通过的以市场为基础的机制，并让更多的协议外国家参与这一解决方案，还须作出更多的努力。
  - The Kyoto agreement represents a first step in the international process, but more must be done both to implement the market-based mechanisms that were adopted in principle in Kyoto and to more fully involve the rest of the world in the solution
  - 只要我们制订合理的政策和过渡策略，开展合适的项目，我们就能够在既解决气候变化问题又保持经济发展方面取得重大的进步
  - We can make significant progress in addressing climate change and sustaining economic growth in the U.S. by adopting reasonable policies, programs and transition strategies.

PEW CENTER Global CLIMATE CHANGE

世界资源学会
World Resources Institute

- 世界资源学会的绿色电力市场开发小组是由12家大公司和世界资源学会组成的联盟，致力于开发企业市场，使具有成本竞争力的新型绿色电力市场至2010年达到1000兆瓦
- WRI's Green Power Market Development Group is a collaboration of 12 leading corporations and the World Resources Institute dedicated to developing corporate markets for 1000 MW of new, cost competitive green power by 2010
- 由世界企业可持续发展理事会发起的"世界资源学会温室气体宣言活动"的任务是：制订世界各国认可的由多方参与的温室气体库存及减排项目的财务和报告标准
- WRI's Greenhouse Gas Protocol Initiative, convened with the World Business Council for Sustainable Development its mission is to develop internationally accepted accounting and reporting standards for organizational GHG inventories and mitigation projects through a multi-stakeholder process

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世界野生生物基金会－气候的拯救者
World Wildlife Fund – Climate Savers

- 其目标是成员公司制定有关气候和能源的创新解决方案
- Goal is for member companies to develop innovative climate and energy solutions
- 其成员公司采纳气候和能源管理策略，包括近期行动和长期行动
- Companies adopt a comprehensive portfolio of climate and energy management strategies that include a mix of immediate and longer-term actions .
- 其成员公司承诺确定一个温室气体减排总目标并与世界野生物基金会共同确定关键行动区域以实现二氧化碳的可计量减排
- Companies commit to an overall greenhouse gas reduction goal and work with WWF to outline the key action areas for achieving measurable reductions in carbon dioxide emissions.
- 成员包括: IBM, Johnson & Johnson, Polaroid Corporation, Nike, Lafarge, and The Collins Companies

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UNDP/GEF

Energy Conservation and Greenhouse Gas Emissions Reduction in Chinese TVEs: Pioneering the VA Approach in China

Zhang Zhihong
Chief Technical Advisor
Workshop on Energy Efficiency Voluntary Agreements
Fragrance Hill Hotel, Beijing
March 30, 2004

Why These Sectors?

- Brick
  - Output: 800 billion bricks, compared with 8 billion in the U.S.
  - Brick plants: about 80,000
- Cement
  - Output: 731 million tons (2003), 40% of world's total
  - Cement plants: 4780, of which 4055 are small
- Coke
  - World's largest producer since 1994
  - Output: 143 million tons (2002), 40% of world's total
  - Export: 15 million tons, more than half of world's total export
- Metal casting
  - World's largest producer since 2000
  - Output: 16.26 million tons (2002)
  - Foundries: more than 20,000, with 1.2 million employees

Project Concept

To remove barriers to the adoption of energy efficient production technologies and products in the four industries of TVEs

Types of barrier
- Policy barriers
- Market barriers
- Technology barriers
- Financial barriers

Activities
- Creating institutional mechanisms at the national and local level
- Carrying out barrier removal activities at 8 pilot counties
- Demonstrating technologies at 8 pilot TVEs
- Replicating barrier removal activities nationwide

Removing Policy Barriers:

Capacity Building of LPICs

- Focal points identified at all pilot counties
- LPIC established at 4 pilot counties and under way at 4 other pilot counties
- Capacity building activities carried out at 4 counties (with the assistance of LPIC contractor)
  - Specific barriers investigated
  - LPIC statute drafted
  - Action plan formulated
  - Energy efficiency VA developed
  - Energy-saving potentials assessed for pilot plants
  - Policy incentives of local governments assessed

Selection of Pilot Enterprises

- Brick
  - ✓ Fangshan Yancun Brick Plant, Beijing
  - ✓ Xi'an Liucun Brick Plant, Shaanxi
  - ✓ Yongxing Shale Brick Plant, Sichuan
- Cement
  - ✓ Shenhe Cement Company, Zhejiang
  - ✓ Lufeng Cement Company, Hubei
- Coke
  - ✓ Gangyuan Coke Company, Shanxi
- Metal Casting
  - ✓ Nanjing Moling Foundry, Jiangsu
  - ✓ Dalian Jinmei Cast Pipe Company, Liaoning

Removing Market Barriers:

The Hongyuan Company

- PTPMC Secretariat registered as a commercial entity: The Hongyuan Company
- Fully operational with 7 full-time staff supported by an external group of technical and financial experts
- Working with pilot enterprises to identify their needs and strategies for technical renovation projects
- Organizing training workshops to identify potential TVEs to participate in the project

Removing Technical Barriers:

Technology Demonstration

- Support for the design of technical renovation projects under way:
  - [illegible] waste heat power plant
  - [illegible] waste heat power plant
  - [illegible] cold-box core making (?)
  - [illegible] kiln renovation and material preparation
  - [illegible] ?
  - [illegible] ?
  - [illegible] ?
  - [illegible] ?

Pioneering the VA Approach

- Project proposed in 1998-99, identified VA as an approach to remove policy barriers
- To be signed between local government and pilot TVE
- Possible extension
  - VA between government and industry association
  - To cover not just energy efficiency but also environmental pollution

Removing Financial Barriers:

Revolving Capital Fund

- Tripartite MOU signed in 2003
- RCF will consist of:
  - GEF: Entrustment loan facility ($1m)
  - ABC: Commercial loan facility ($2m)
  - MOA: Capacity building facility ($1m)
- Entrustment loan
  - Managed by Hongyuan
  - No interest but fee charged by ABC
  - Priority given to pilot TVEs
  - Each loan not to exceed $200,000
  - Tied with ABC commercial loan approval

VA Policy/Legislation in China

- Explicit reference to the voluntary approach in the Cleaner Production Promotion Law

第二十九条

企业在污染物排放达到国家和地方规定的排放标准的[illegible]上，可以自愿与有管辖权的经济贸易行政主管部门和环境保护行政主管部门签订进一步节约资源、削减污染物排放量的协议。该经济贸易行政主管部门和环境保护行政主管部门应当在当地主要媒体上公布该企业的名称以及节约资源、防治污染的成果。

Dissemination of Best Practices

- Identification of 100 TVEs and 20 counties for dissemination
- Training workshops to be held
- Project proposals/feasibility studies for non-pilot TVEs
- Marketing of energy-efficient building materials

VA Projects/Programs in China

- EF Shandong SETC
  - EF VA pilot project with steel industry
- EF Chinese Steel Industry Association
  - EF VA study
- EF-Peking University
  - Policy study on EF and pollution reduction VA
- WWF China
  - Climate Saver
  - Voluntary emissions reduction in 6 sectors: power generation, power grid, supermarket, restaurant, cement, and beer
- UNDP GEF End-Use Energy Efficiency Program
  - Steel, cement, and chemical industry
- UNDP GEF Energy Conservation and GHG Emissions Reduction in Chinese TVEs
  - Brick, cement, coking, and metal casting industries
  - VA at 8 pilot project sites and replication

VA with Chinese Characteristics

- What can we learn from the international experience?
- To what extent can the international successes be transferred to China?
- What are the lessons learned from those countries?
- How is the political, institutional, social, and economic situation different in China?
- What role can the VA play in Chinese energy and environmental policymaking?

ECOFYS

annex 9.8.4

自愿协议监督的国际经验
International Experience with Monitoring of Voluntary Agreements

March 30, 2004

Prof. Dr. Kornelis Blok
Suzanne Joosen, Mirjam Harmelink

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目标的形式：
What kind of targets are there?

- 具体目标（单位产品能耗或能效指数）Specific targets (SEC or EEI)
  - 相对SEC或EEI水平 Relative SEC or EEI levels
  - 绝对的SEC或EEI水平 Absolute SEC or EEI levels
  - 基准 Benchmarks
- 绝对目标 Absolute targets
  - 绝对能源消耗 Absolute energy use
  - 绝对 CO_2 排放 Absolute CO_2-emissions
- 经济目标 Economic targets
  - 经济成本效益目标 Cost-effectiveness targets (social perspective)
  - 赢利目标 Profitability targets (business point-of-view)
  - 偿还能力目标 Ability-to-pay targets

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内容 Contents

ECOFYS

单位产品能耗
Specific energy consumption

$$SEC = \frac{E}{P}$$

SEC = specific energy consumption 单位产品能耗
E = energy consumption by the sector
行业能源消耗总量
P = production by the sector
行业的总产量
→→only suitable for homogeneous plants! 只适用同类工厂

ECOFYS

自愿协议的监督要点
Key elements in monitoring (of VA)

- 清晰透明的监督方针
  ——监督方针应告知企业报告的内容、时间、方式以及报告对象
  Clear and transparent monitoring guidelines
  - Guidelines should give firms an overview of what needs to be reported, when it should be reported, how it should be reported and to whom.
- 独立核实
  ——由独立方核实上交信息，并监督监督过程
  Independent verification
  - An independent party should verify the submitted information and guard the monitoring procedures.
- 阶段性独立评估
  ——自愿协议的效果和效力应时常重估
  Periodical independent evaluation.
  - From time-to-time the effectiveness and efficiency of VA should be evaluated

ECOFYS

能源衡量的注意事项
Issues in measuring energy

- 如何转化为初级能源？
  How to convert to primary energy?
- 如何处理非能源目的的能源使用？
  What to do with the use of energy for non-energy purposes?
- 如何考虑热电联产
  How to take into account cogeneration?
- 如何处理可再生能源投入？
  What to do with renewable energy inputs
- 如何处理废能源投入
  What to do with waste energy inputs?

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单位产品能耗
Specific energy consumption

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能效指数合成（EEI） **Aggregated energy efficiency index**

$$EEI = 100 \cdot \frac{\sum_{i=1}^{n} P_i \cdot SEC_i}{\sum_{i=1}^{n} P_i \cdot SEC_{i,ref}} = 100 \cdot \frac{E_{tot}}{\sum_{i=1}^{n} P_i \cdot SEC_{i,ref}} = \frac{E_{tot}}{E_{tot,ref}}$$

EEI = energy efficiency index 能效指数
n = number of products to be aggregated 需要合成的产品种类
SEC_i = actual SEC-value for product i 产品i实际的SEC值
$SEC_{i,ref}$ = best practice SEC-value for product i 产品i的最佳SEC值
P_i = production quantity for product i 产品i的产量
E_{tot} = total actual energy consumption for all products 所有产品的能耗总量
$E_{tot,ref}$ = total *reference* energy consumption for all products 所有产品的能耗参考总量

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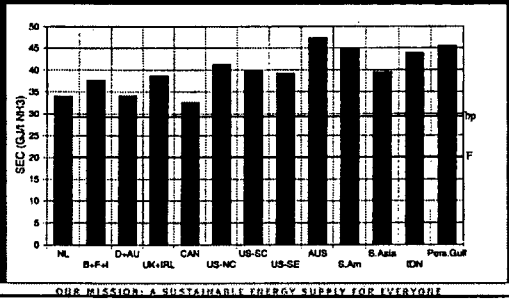
合成氨的单位产品能耗
Specific energy consumption in ammonia production



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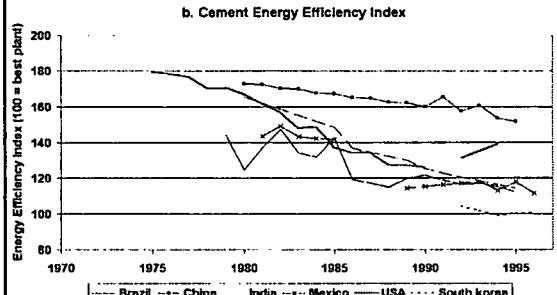
水泥能效指数 **Energy efficiency index cement**



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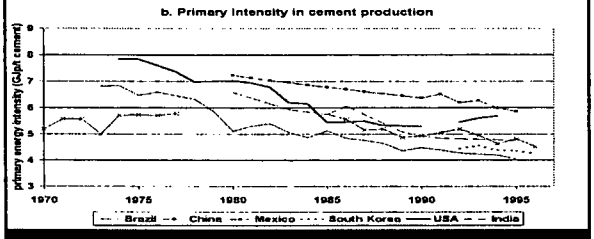
水泥制品的单位产品能耗
Specific energy consumption for cement production



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例1：荷兰 **Example 1: The Netherlands**

能效的长期工业协议（LTA）
Industrial Long Term Agreements (LTA) on energy efficiency

- 第一代LTA：1989年-2000年 LTA 1st generation: 1989 – 2000
——关于工艺能效提高的协议
agreements on improvement of process energy efficiency
- 第二代LTA：2001年-2012年 LTA 2nd generation: 2001 – 2012
——关于工艺能效提高的协议，以及关于能源管理、可再生能源和能效产品设计的协议
agreement on improvement of process energy efficiency but also on energy care, renewable energy and energy efficient product design
- 基准协议：1999年-2012年（大公司）
Benchmarking agreement: 1999 – 2012 (big companies)

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监督程序 Monitoring Protocol

最主要的条目 Most important items:

- 监督过程的组织
  Organization of the monitoring process
- 监督报告的格式
  Formats for monitoring reports
- 定义，如能源使用和能源节约的措施
  Definitions on e.g. energy use and energy saving measures
- 计算 Calculation of the
  - 能效指数 Energy Efficiency Index (EEI)
  - 再生能源指数 Renewable Energy Index (REI)
  - 能效产品开发指数 Energy-efficient Product development Index (EPI)
- 数据的保密
  Confidentially of data

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能效指数 Energy Efficiency Index (EEI)

$$EEI = 100 \cdot \frac{E_{tot}}{\sum_{i=1}^{n} P_i \cdot SEC_{i,ref}}$$

年度监督要求：
Annual monitoring requirements:
- 总能耗(E_{tot}) total energy use (E_{tot})
- 每种产品的产量(P_i) production per product (P_i)

需预先确定：
To be determined initially:
- 单位产品能耗的参照值 reference value for SEC per product ($SEC_{i,ref}$)

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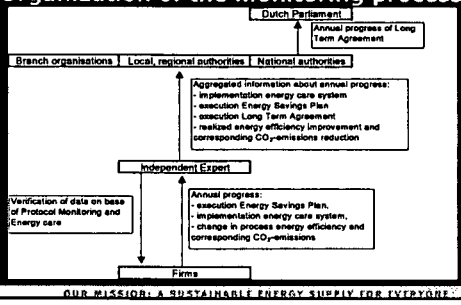
监督过程的组织
Organization of the monitoring process



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对企业的监督要求
Monitoring requirements for firms

- 企业每年（4月1日）必须向独立专家(荷兰能源与环境署 Novem)提交的检测报告包括：
  Annually (before April, 1) firms must submit a monitoring report to Independent Expert (Novem) that includes:

a: 节能措施的实施情况
progress on the implementation of the energy saving measures

b: 能源管理系统的实施情况
progress on the implementation of an energy care system

c: 能效的实现
realized energy efficiency

d: CO_2的减排
avoided CO_2-emissions

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能耗的定义 Definition Energy Use

- 能耗是指企业能源供应总量减去非能源用途的量
  Energy use is the total *net* energy supply to the firm minus the non-energetic use.
- 能量载体的非能量使用是指被产品中吸收的能量理论上可再次释放。The non-energetic use of energy carriers means energy which is absorbed in the product and in principle can be released again.
- 电和热转变为初级能源
  Electricity and heat are converted to primary energy

ECOFYS

企业的报告格式和方针（第二代长期协议）
Reporting formats and guidelines for firms
(Second generation Long-Term Agreements)

- 能源数据 Energy data
- 产量变化 Changes in production volume
- 整体成果 Total results

Energy data					
	Unit (N	Energy content Year (GJ/N	1998	2000	2001
ELECTRICITY					
Purchased electricity total[1]	kWh	9.00E-03			
Own use of renewable electricity from participation [3]	kWh	9.00E-03			
Own generated renewable electricity (excluding biofuels)	kWh	9.00E-03			
Supplied electricity total[1] to third parties	kWh	9.00E-03			
Revenue electricity total[1] to grid	kWh	9.00E-03			
Netto use electricity	kWh		0	0	0
NATURAL GAS					
Purchased natural gas [2]	Nm3	3.17E-02			
Supplied natural gas (to third parties)	Nm3	3.17E-02			
Netto use natural gas	Nm3		0	0	0
HEAT					
Purchased heat total[1]	GJ	1.11			
Own use of renewable heat from participation [3]	GJ	1.11			
Own generated renewable heat (excluding biofuels)	GJ	1.11			
Supplied heat total[1] to third parties	GJ	1.11			
Netto use heat	GJ		0	0	0
REMAINING FUELS (INCL. RENEWABLE)					
Netto use remaining fuels	GJ		0	0	0

[1] Total = conventional, renewable, and electricity/heat from CHP outside own installation
[2] This is including natural gas for CHP when CHP belongs to own installation, and excluding natural gas for CHP when CHP is outside own installation
[3] Participation: for instance participation to cooperative wind park

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独立专家（荷兰能源与环境署）
Independent Expert (Novem)

- （荷兰能源与环境署）独立专家由多个部委指定并资助
  The Independent Expert (Novem) is appointed and financed through several Ministries.
- 荷兰能源与环境署核实监测报告是否与协议相符（弱核实）
  Novem verifies whether the monitoring reports are in accordance with the Protocol (weak verification)
- 荷兰能源与环境署不会通过与调查的项目数据或实地访问来监测报告中的信息
  Novem does not validate the information in the monitoring reports, by checking the information with independent statistics or performing site visits
- 荷兰能源与环境署每年向各支部、地方性、区域性及政府机构提供总信息
  Annually Novem provides aggregated information to branch organizations, local, regional authorities and Ministries

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修正系数 Correction factors

- 外部因素可能造成初能耗结果是能效指数无法反映企业中所实施的措施
  External factors may cause such effects on the energy use that an EEI no longer reflects the measures that were implemented by the firms.
- 在荷兰，可在下情况会采取修正措施：
  In the Netherlands, corrections may be used when:
  - 由于环境、健康和安全方面的规定而需要采用增加能耗的方法
    Increase of energy use due to measures that are necessary because of environmental, health and safety regulations
  - 在原材料、制品技术规格和生产能力利用率的变化
    Changes in raw materials, product specifications, production capacity utilisation rate
  - 天气变化
    Changes in weather

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例2：澳大利亚 Example 2: Australia

- 1995年开始的"气室挑战"
  Greenhouse Challenge, launched in 1995
- 澳大利亚联邦政府和工业部门将于推出合算的、灵活的自愿措施，建立温室和工艺效益的指数提高，实现大幅减少温室气体的承诺
  The Commonwealth and industry will work together to put in place cost-effective, flexible, voluntary measures that will constitute credible commitments to significant greenhouse gas reductions through improvements in energy and process efficiency on a continuing basis and by enhancing greenhouse gas sinks.

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修正系数中的问题
Problems with correction factors

- 在荷兰，修正系数总是单向使用，它降低能效指数）
  In the Netherlands correction factors always worked one way (it decreased the EEI)
- 是否明确修正系数的使用
  Whether correction factors will be used should be clear in advance
- 修正指数的监督须透明
  Also the monitoring of correction factors should be transparent

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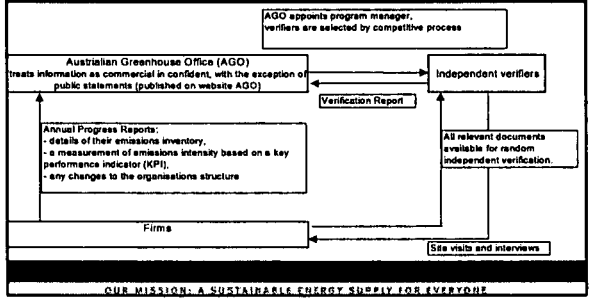
监督过程的组织
Organization of the monitoring process



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对企业的监督要求
Monitoring requirement for firms

- 企业每年须向澳大利亚温室办公室(AGO)递交监督报告
  Annually firms have to submit a monitoring report to the Australian Greenhouse Office (AGO)
- 监督报告须包括：
  Monitoring report should include:
  - 排放的详细清单
    details of emissions inventory
  - 基于关键绩效指标（KPI）的排放强度的度量，如吨CO_2/吨产品
    a measurement of emissions intensity based on a Key Performance Indicator (KPI), e.g. ton CO_2/ton product
  - 机构变化
    any changes to the organisations structure
- 公开读物将公布于澳大利亚温室办公室的网站
  A public statement which will be published on the Australian Greenhouse Office (AGO) web site.

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独立检验（3）
Independent verification (3)

- 各企业需向检验员提供的主要信息包括
  Key information items that the firms had to supply to the verifiers were
  - 一份成员合作协议书和最近的监督报告；
    a copy of the Member's Cooperative Agreement and most recent monitoring report;
  - 用于计算排放的方法，包括排放因子、应用公式，以及它们的出处；
    methods used for emissions calculations, including emission factors, equations used, and the source of factors and equations;
  - 用于计算减排的方法；
    methods used for abatement calculations;
  - 相关文件、数据库和计算电子数据表。
    relevant documents, databases and calculation spreadsheets.
- 检验员将进行单次或多次实地考察。考察地的数量和位置取决于成员的清单规模、结构，以及相关的检验经费
  The verifiers paid a single and sometimes more site visits. The selection of the number and location of the sites to be verified was determined after consideration of the size of Member's inventories, structure, and the associated costs of verification.

OUR MISSION: A SUSTAINABLE ENERGY SUPPLY FOR EVERYONE

独立检验（1）
Independent verification (1)

- 加入"温室挑战"的企业应为随机的独立检验准备相关文档
  Firms that have joined the Greenhouse Challenge have to make relevant documents available for random independent verification.
- 澳大利亚温室办公室于1999年10月请Det Norske Veritas (DNV)作第一轮监督报告的独立检验工作；2002年2月，由雪山工程公司(SMEC)完成第二轮
  In October 1999 the Australian Greenhouse Office engaged Det Norske Veritas (DNV) to manage the first round of independent verifications of the submitted monitoring reports. Snowy Mountains Engineering Corporation (SMEC) managed the second round of independent verifications, in February 2002

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例5：欧盟排放贸易计划
Example 5: Emissions Trading Scheme in the EU

- 欧盟将于2005年开始对大型工业企业和电力制造厂实行温室气体贸易
  In 2005 the European Union will start with greenhouse gas emissions trading for large industry firms and electricity production companies
- 在这个排放贸易计划中，温室气体排放的监督是非常重要的一部分
  Monitoring of the greenhouse gas emissions is a crucial element of this emissions trading scheme
- 欧洲委员会提供监督指导原则（由Ecofys应用现有原则起草）
  The European Commission has supplied monitoring guidelines (developed by Ecofys, making use of existing protocols)

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独立检验（2）
Independent verification (2)

- 独立检验由专门的小组成员完成，独立检验小组的成员通过竞争上岗，并为2002年的检验工作进行了调整
  A panel of independent verifiers was engaged to execute independent verifications. This panel was engaged through a competitive process and has been revised for the 2002 round of independent verifications.
- 检验过程包括核对数据，检查用于产生数据的各系统，以及提供关于增强数据和报告系统的指导原则
  The verification process involved checking data, reviewing the systems used to generate the data, and providing guidance with respect to improvements to data and reporting systems.
- 指导原则要保障检验工作在各行业中的连续性
  The verification guidelines ensure that verifications are consistent across industry sectors.

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监督的程序
The monitoring protocol

- 企业须向国家排放部门递交监督程序，程序中要说明如何测量排放物，以及在公司管理中如何贯彻。监督程序必须得到排放权威部门的验证。
  Firms have to submit a monitoring protocol to the national emission authority. These protocols describe how emissions will be measured and how this will be laid down in the administration of the companies. The monitoring protocols have to be validated by the emission authority.

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年度监督报告
Annual monitoring report

- 企业每年必须在4月1日前提交上一年度的排放报告
  Companies have to hand in annual emission reports each year before 1 April over the year before.
- 年度排放报告中应包括:
  The annual emission report shall include:
  - 设备的数据
    data identifying the installation
  - 计算方法的说明（活动数据、排放因子和氧化/转换因子）measurement of calculation method, (activity data, emissions factors and oxidation / conversion factors)
  - 方法的改变，以及改变的原因
    changes in method and reasons for these changes
  - 设备的改变
    changes in installations
- 独立检验非常必要（严格检验）
  Independent verification is necessary (strong verification)

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燃烧设备的排放
Emissions from combustion installations

Activity N				
Type of Annex I activity:				
Description of activity:				
Fossil fuels				
Fuel 1				
Fossil fuel				
Type of fuel:				
		Unit	Data	Tier applied
	Activity data	t or m^3		
		TJ		
	Emission factor	tCO_2/TJ		
	Oxidation factor			
	Total emissions	tCO_2		

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Reserve slides

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建议 Recommendations

- 提前制定监督原则
  Develop monitoring guidelines in advance
  - 如何分解生产 how to disaggregate production
  - 如何衡量能耗 how to measure energy use
  - 是否使用修正系数 whether to use correction factors
- 进行独立验证（严格验证）
  Apply independent verification ('strong verification')
- 注重国际经验交流
  Make use of international experience

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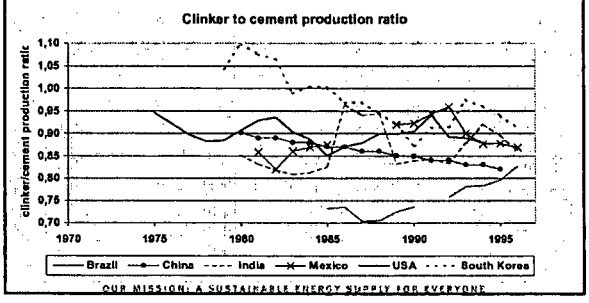
熟料/水泥比 Clinker/cement ratio



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	Installation A	Installation B	A+B = branch
Production 1998 (Mton)	60	60	
Energy1998 (TJ)	60	90	150
E/prod 1998 (GJ/ton)	1	1,5	
Production 2001 (Mton)	75	60	
Energy2001 (TJ)	70	75	145
E/prod 2001 (GJ/ton)	0,93	1,25	
Production 2002 (Mton)	100	70	
Energy 2002 (TJ)	90	84	174
E/prod 2002 (GJ/ton)	0,90	1,2	
EEI 2001	93	83	88
EEI 2002	90	80	85
dE 2002	3,33	3,50	6,15
	Sum dE of A and B =		6,83
	dE is change productmix =		-0,68

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能源和CO_2的数据

Energy and CO_2 data

EMISSIONS SOURCE	CONSUMPTION (UNITS)	CONVERSION FACTOR	CO_2-e (TONNES)
Electricity(kWh)			
Natural Gas (GJ)			
LPG - non-transport (Tonnes)		2.9	
Petroleum Products - Transport (Kilolitres)			
LPG		1.6	
Petrol (unleaded/leaded)		2.5	
Automotive Diesel Oil (ADO)		2.7	
Industrial diesel (ac)		2.8	
CNG (Kg/M)		2.4	
Coal (Tonnes)			
Waste (Tonnes)			
Comingled		1.2	
Paper & Cardboard		2.8	
Textiles		3.9	
Wood/straw		2.1	
Garden		1.2	
Food		1.5	
Medical Waste		0.5	
Municipal wastewater			
Industrial wastewater			
SF6(tons)		23 900	
OTHER SOURCES (eg. fugitive emissions)			
GROSS EMISSIONS			
OFFSETS:			
SEQUESTRATION			
GREENHOUSE FRIENDLY			
NET EMISSIONS			

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Results

	Unit	Year 1998	2000	2001
Primair energy use electricity total	GJ	0	0	0
Primair energy use natural gas	GJ	0	0	0
Primair energy use heat total	GJ	0	0	0
Primair energy use remaining	GJ	0	0	0
Total energy use	GJ	0	0	0
Reference energy	GJ	0	0	0
Avoided CO_2-emissions related to new implemented measure in monitoring year	ton			0
EEI	-	0.0	0.0	0.0
Foundations EEI	%			0
Avoided CO_2-emissions related to change in EEI	ton			0
DEI	-			0.0
Avoided CO_2-emissions related to change in DEI	ton			0
EPI	-			0.0
Avoided CO_2-emissions related to change in EPI	ton			0
TEEI	-			-200.0
Avoided CO_2-emissions related to change in TEEI	ton			0
Level of energy care	-			D
Points in frame of energy care	-			0

Remarks: The foundation of the EEI has to be minimal 80%

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整体成果表

Table for total results

EVERYONE

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表格格式——减轻CO_2的排放

Format CO_2 emission abatement

Item 3. MAJOR GREENHOUSE GAS EMISSION ABATEMENT INITIATIVES

ACTION	COMPLETION DATE	ACTUAL ANNUAL CO_2-e SAVINGS

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独立评估 Independent Evaluation

- 依照协议一（LTA 1）的实施效力于1997年得到独立评估
  In 1997 the effectiveness and efficiency of LTA 1 were independently evaluated
- 依照协议二（LTA 2）将于2004年评估，同时包括：
  The LTA 2 will be evaluated in 2004 and this evaluation will among others include:
  - LTA在减轻CO_2排放和能源效率方面的贡献
    Contribution of the LTA on energy efficiency improvement and CO_2 emission reduction
  - LTA的实施成本
    Cost of the implementation of the LTA
  - 独立专家的工作质量
    Quality of delivered work of Independent Expert
  - 议定书的实用性
    Workability of used Protocols
  - 继续LTA的愿望
    Desirability of continuation of the LTA

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表格格式——影响和主要指标

Formats impact and key indicators

Item 4. OTHER MAIN FACTORS INFLUENCING EMISSIONS LEVELS

FACTOR	DETAILS
Business Activity	
Measurement Methodology	
Other	

Item 5. KEY PERFORMANCE INDICATORS

Tonnes of CO_2-e (Net Emissions- as indicated in Item 2)	Total units of measure	KPI value (Net emissions/units of measure)	Last reported KPI	KPI variance (+ve or -ve)

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例2：德国　Example 2: Germany

- 德国工业关于防止全球变暖的声明 - DGWP
  Declaration of the German Industry on Global Warming Prevention (DGWP)
- 1995年签署第一个协议，并在1996年3月修改
  First agreement in 1995, Updates agreement in March 1996
- 1996年的DGWP表达了工业界愿意在自愿的基础上努力达到其目标：比如以1990年为基准，预计在2005年达到各个工业的单位能耗和/或CO2排放量减少20%。在这个总宣言下，参与的分支机构均发表了各自的宣言，公布其各自的目标
  The DGWP of 1996 expresses the industry's willingness to undertake extraordinary efforts on a voluntary basis in order to achieve a reduction of 20% of the total industry's specific energy consumption and/or specific CO_2-emissions until the year 2005 (base year 1990). Under the umbrella declaration, the participating branch associations published their own declarations with branch specific targets.

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分支机构和独立专家的职能
Role of the Branch organisation and the Independent Expert

- 分支机构向独立专家（RWI，埃森）提供年度监督报告
  The branch associations provide an annual monitoring reports to an Independent Expert, the Rheinisch-Westfalische Institute fur Wirtschaftsforschung (RWI,Essen)
- RWI受托负责前两份分行业的年度报告，此报告由分支机构和官方统计提供的监督报告为基础
  The RWI was entrusted to carry out the first two annual sector-by-sector monitoring reports on the base of monitoring reports provided by the branch associations and official statistics

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监督过程的组织
Organization of the monitoring process

- 相对缺少组织，如与荷兰项目相比：无程序/无指导纲领，无企业级的模版
  Less structured than for instance the Netherlands: no protocols/guidelines, no formats at firm level available

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独立专家　Independent Expert (RWI)

- RWI尽可能把分支组织报告的数据与官方的统计数据进行核准
  The self-reported data by branch organizations are as far as possible checked with official statistics by the RWI
- 没有独立的企业级的数据收集和数据核实
  Independent data collections and validation of data on the firm level does not take place
- 行业上报的信息不充分，不完全，不透明
  Quality of the information reported by the sectors is insufficient, not complete and not transparent
- RWI用于确定效率提高的方法是简单的，如不考虑生产能力的波动
  Methodology used by RWI to determine efficiency improvements was to simple and did e.g. not take into account fluctuations in capacity utilization

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对企业的监督要求
Monitoring requirement for firms

- 企业每年必须完成分支机构发放的调查
  Annually, firms must fill in the survey which is been sent around by branch organization
- 企业必须提交关于绝对能耗和单位能耗的信息
  Firms must provide information on the absolute and specific energy consumption

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例4：英国
Example 4: United Kingdom (UK)

- 绝对目标和相对目标都可能
  Both absolute and relative targets possible
- 与英国的排放交易制度相关
  Connected to the UK emission trading system

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Annex 9.8.5

关于荷兰 RMI MIDDELBURG 铸造厂的节能工作介绍
ENERGY SAVINGS

RMI MIDDELBURG
THE NETHERLANDS

1989 – 2001

ir G HENDERIECKX

GIETECH BV

MARCH 30, 2004

采取的行动 ACTIONS

好的后勤管理 GOOD HOUSEKEEPING

较低的效果 LOW EFFECT
短期（即期） SHORT TERM (IMMEDIATELY)

生产工艺控制 PROCESS CONTROL

中等的效果 MEDIUM EFFECT
中期（2年） MEDIUM TERM (2 YEARS)

投资 INVESTMENTS

高效 HIGH EFFECT
长期（4年） LONG TERM (4 YEARS)

协议 AGREEMENT

政府与铸造行业
FROM GOVERNMENT WITH FOUNDRY INDUSTRY
1995年 YEAR OF 1995

能耗降低情况 DECREASE OF ENERGY:

整个铸造行业2000年的能耗比1989年降低了16%
16 % 1989 COMPARED TO 2000
TOTAL FOUNDRY INDUSTRY
其中不包括用于环保设施和工人劳动保护的能源
Except Energy For Environmental Equipment Workers Security
室外温度补贴 COMPENSATION FOR OUTSIDE TEMPERATURE

影 响 INFLUENCES

能耗随着以下因素而增加
Energy consumption increases with

1. 回炉与返工 Scrap & Rework 增加率 Increasing Rate
2. 金属类别 type Of Material
   灰铁、球铁、钢 Grey Iron, Ductile Iron, Steel
3. 质量水平 Quality Level 质量水平提高 Increasing Level
4. 铸件尺寸 Size Of Castings 重量降低 Decreasing Weight
5. 工作负荷 Work Load 负荷下降 Decreasing Load
6. 新产品 New Products 数量增加 Increasing Amount

铸造厂的能耗
ENERGY CONSUMPTION OF FOUNDRY

生产 PRODUCTION

冶炼 MELTING
热处理 HEAT TREATMENT
高压空气 COMPRESSED AIR
其它 OTHERS

不合格产品 NON CONFORM PRODUCTS
返工 REWORK
报废回炉 SCRAP

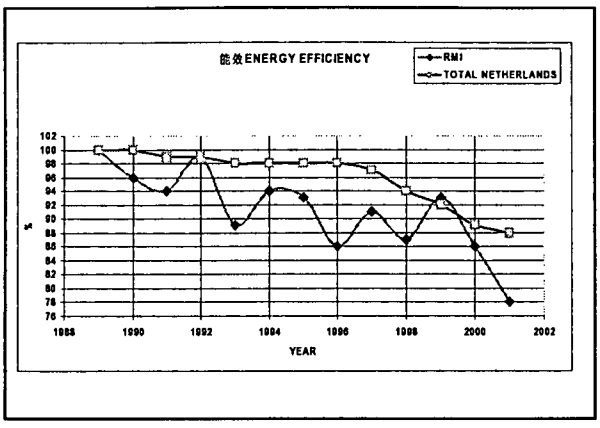
评估程序 EVALUATION PROGRAM

优点 ADVANTAGE

铸造厂之间可以分享生产技术知识和诀窍
FOUNDRIES SHARE KNOWLEDGE AND KNOW HOW
效果均衡 EFFECT IS BALANCED
便于政府控制 EASY CONTROL FOR GOVERNMENT
便于企业报告 EASY REPORTING FOR FOUNDRIES

缺点 DESADVANTAGE

涵盖了不良运作 COVERS BAD PERFORMANCE
政府与行业之间的信心
CONFIDANCE BETWEEN GOVERNMENT AND INDUSTRY



荷兰RMI MIDDELBURG铸造厂

单位能耗 **ENERGY PER TONNE** **15,9 MJ / TONNE**
荷兰全国平均值 **AVERAGE NETHERLANDS** **17,0 MJ / TONNE**

投资INVESTMENTS

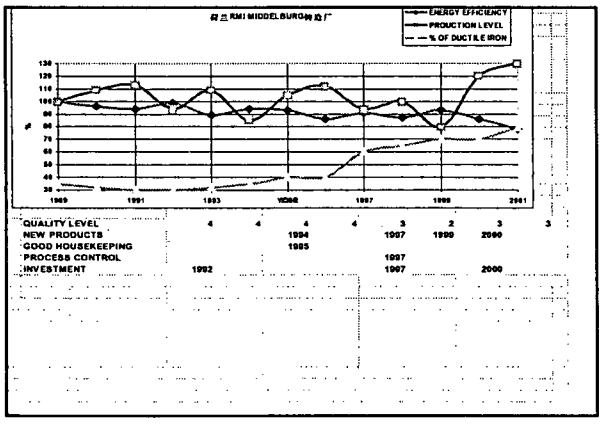
1992 冶炼设备 **MELTING EQUIPMENT**
1997 压缩空气 **COMPRESSED AIR**
2000 型砂输送与混砂 **SAND TRANSPORT AND MIXERS**

好的后勤管理 **GOOD HOUSEKEEPING** 始于**1995 FROM 1995**

工艺控制 **PROCESS CONTROL** 始于**1997 FROM 1997**

新产品 **NEW PRODUCTS** **1994 1997 2000**

质量水平 **QUALITY LEVEL**
1999年前增加，之后下降
INCREASING TO 1999, DECREASING FROM 1999
球铁 DUCTILE IRON 增加的%
INCREASING PERCENTAGE



ANNEX 9.8.6

ENERGY SAVINGS

1. Agreement

The government from the Netherlands did make an agreement with the foundry industry to target for a 16 % energy decrease in the year of 2000, compared to the reference year of 1989.

The target has to be reached by the total group of participating foundries and no individual foundry will be evaluated.

Each year, the group will report the results and make comments.

The basic figure is the energy consumption of a particular year compared to the energy consumption of 1989. It is called the "energy efficiency index" or "EEI".
The energy consumption for all the participating foundries was 17,0 MJ / tonne and 15,9 for the foundry RMI Middelburg.

It was agreed that some energy, due to:

1. fluctuating temperature
2. extra equipment to save the environment
3. extra equipment to increase the working quality for the workers

was excluded from the figures. So a correction for them is made.

2. Energy consumption

In a foundry, melting is consuming most of the energy, between 40 and 60 %, depending on melting equipment and product.

After melting comes the heat treatment, which is especially for steel production high, less for ductile iron and even lesser for grey iron.

The most important consumer after these two items, is the production and distribution of compressed air, which is used for transporting sand, in shot blasting equipment, fettling and other equipment.

The other energy is consumed by heating, equipment engines...

But the most important factor is the "non conform production". A product, which does not comply with the requirements, needs at least some rework. But it can be that the casting has to be scrapped, which is a total loss of energy.

3. Actions

There are three types of actions, each of them has other results.

Good Housekeeping

If every employee in the company is looking for wasting energy like lights, running compressors, filters..., and some energy savings will be obtained.

This is possible on very short term (immediately), but the result is low but constant and has no cost.

Process control

The foundry must know its process and control it. This will avoid extra work and especially scrap.

This can be done on medium term (2 years) and will have a medium result, depending on the current amount of rework and scrap.

Investments

The investments need a proper study of the necessity of the foundry and the possibilities of the equipment offered in the market.
A good study will need 3 to 4 years, included the installation of the equipment. The problem is mostly the lack of capital to invest.

It can be that the first year, it will give a loss of energy due to the learning curve to work with the particular equipment, especially if new techniques are involved. This was the case for RMI Middelburg with the new rotary furnaces, operating with oxygen and natural gas, in the year of 1992.

4. Influences

The rework and scrap rate is the most influencing item. By controlling the process, it is possible to reduce this rate by 50 to 60 %, which means a decrease of energy without any cost.

If the foundry is changing its program by making other materials, this can have a large influence. It is clear that grey iron needs the lowest amount of energy, ductile iron some more and steel much more, due to the higher melting temperature, larger amount of risers and heat treatment.

Another factor is the quality level of the delivered products. A higher quality level needs more risers (which means material), which must be removed (extra fettling work) and mostly more fettling and testing.

A small and complicated casting will need much more energy per tonne than a large and simple casting.

Then the workload is important. Each company has a constant level of energy consumption due to the offices, heating and stand by situation of a lot of equipment. The more production the lower the influence of this constant level and the lower the energy consumption per tonne.

And last but not least is the fact of "new products". Each new product will have a higher risk for scrap and rework, but also the production is not yet optimal and a lot of time and energy is lost by learning the production.

5. Particular case: RMI Middelburg

It is clear that before 1995, very few efforts were done by the foundries to decrease the energy consumption.
But RMI Middelburg did invest in 1992 in complete new melting equipment, which used oxygen – gas burners instead of air – oil burners. This was a very new technique and little assistance was given by the supplier. This resulted in an increase of energy consumption the first year. But after 2 to 3 years, the melting energy was decreased by 20 %.

From 1995 on, good housekeeping was introduced and resulted in a decrease of the energy consumption.

New products came in, as well as an increasing amount of ductile iron production, from 1994 on. This negative effect could be compensated by an increasing production volume.

From 1997 on, the quality level of the products did increase and the production output decreased, which resulted in an increase of energy consumption in 1997.

In 1999, the start of "process control" and the investment of a new "compressed air equipment", as well as a decrease in production and the increase of quality level, resulted in a small increase of the consumption, after that 1998 was somewhat lower.

At the end of 1999 the increase of production volume as well as a small decrease in quality level, the full efficiency of process control and a new investment, did compensate completely the increase of ductile iron and new products and brought the result to a very good level, 78,2 %.

6. Conclusion

It is a very good exercise for the foundry to be faced with a voluntary target, which should be obtained for the honour of the industry.

The cost of all efforts is largely compensated by the profit of energy consumption, which does continuously increase in price and has sometimes quite some shortage.

Annex 9.8.7

China Sustainable Energy Program
The Energy Foundation
能源基金会中国可持续能源项目

节能减污合作协议的政策和立法建议
Policy and Legislation Recommendations for Energy Saving and Pollution Reduction Cooperative Agreements

王学军
Xuejun Wang
北京大学环境学院
College of Environmental Sciences, Peking University
2004.3

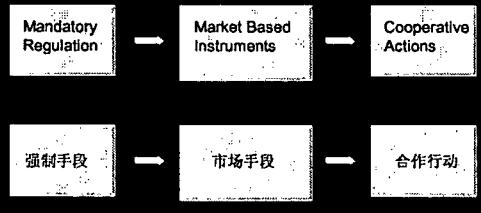
Policy and Legislation Framework
政策和法律框架

The existing legal and policy framework has provided a good foundation for energy saving practices in China.
现有的法律和政策框架为节能工作提供了一个良好的基础

In the last six years, ECL has played a very important role in promoting energy saving for China's industry sector.
在过去的6年中，《节能法》在促进工业节能方面发挥了重要作用

The adoption of Cleaner Production Promotion Law provides new mechanisms for energy saving.
《清洁生产促进法》的实施为节能工作提供了新的机制

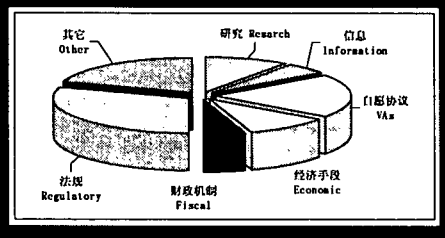
Development of Energy and Environmental Policies
能源和环境政策的发展



Cooperative Agreements on Energy Saving (CAs)
节能合作协议

CA is a new policy mechanism in which enterprises can reach agreements with government authorities or institutions authorized by the government, and promise voluntarily to reach certain targets for energy saving in a given period of time. In return, the government authorities provide incentive measures, regulatory relief, or publicize the performance of the enterprises, in order to stimulate the involvement of enterprises in the voluntary programs.

节能合作协议是一个新的政策手段，它是指企业与政府部门或政府授权的组织签订协议，自愿承诺在一定时间内实现一定的节能目标，与此同时，政府机构应为企业提供电厂的激励措施，以促使企业加入合作协议。



工业温室气体减排方面常用的政策手段及其使用频率
Types of policy instruments to address greenhouse gas emissions in industry and how often they are used

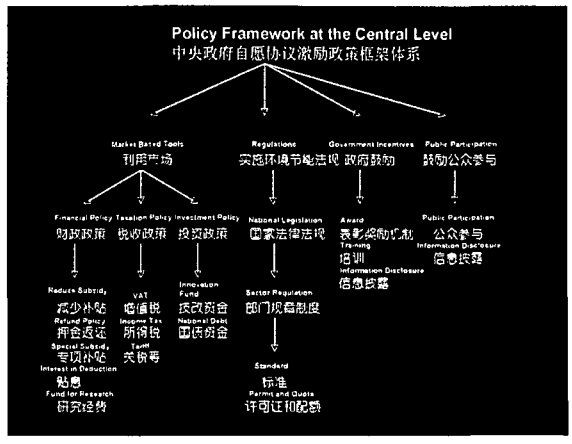
Source: OECD, 2003

Cooperative Agreements on Energy Saving (CAs)
节能合作协议

- The relevant government authorities should assume certain responsibilities according to the agreements.
  相应的政府机构应根据协议承担相应的责任
- The government should supervise the performance of the enterprises involved in the CA programs
  政府应监督企业的行为
- The government needs to provide incentives for the enterprises
  政府应为企业提供激励手段
- CAs are commonly enforced in conjunction with other "non-voluntary" regulations and policies.
  自愿协议常与"非自愿"手段共同使用

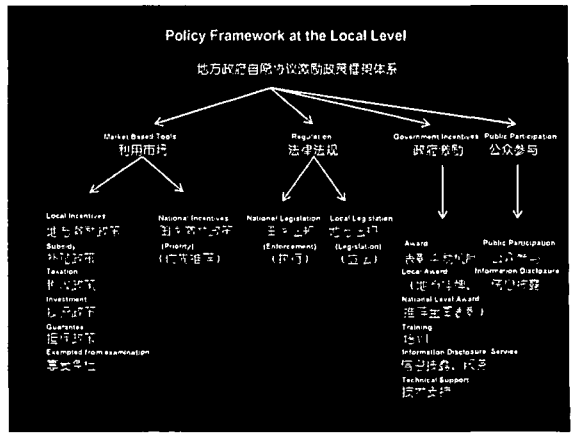
Cooperative Agreements on Energy Saving (CAs)
节能合作协议

- Compared with mandatory measures, CAs can provide enterprises with a dynamic and flexible mechanism
  与强制性手段相比，合作协议可为企业提供动态、灵活的机制
- CAs can promote the transformation of industrial environmental management from end-of-pipe treatment to cleaner production
  促进工业环境管理从末端治理向清洁生产转变
- CAs can increase communications and confidence between government and enterprises, and between enterprises and the public
  鼓励政府和企业之间的对话和建立信任机制
- They can help to reduce administrative and enforcement costs
  是建设社会主义市场经济体制的需要，也有利于降低管理和实施成本



Procedures and Measures for the Promotion of Cooperative Agreements
推进合作协议的具体步骤和措施

- Pilot study on CAs
  合作协议试点研究
- Establishment of CAs policy system at both central and local levels
  在中央和地方两个层次建立支持政策体系
- Create management, monitoring and evaluation systems for CAs at both central and local levels
  建立管理、监督、评价体系
- Formulation of "Implementation Method for Energy Saving and Pollution Reduction Cooperative Agreements"
  制订"节能减污合作协议实施办法"



合作协议的政策建议
Policy recommendation for CAs

原则：

- 以现有政策为主，实现政策的配套应用
- 提出若干新的政策手段
- 尽可能减少行政干预

激励政策之一：表彰和公布企业的表现，提供信息和技术帮助
Incentives: Award, information disclosure and technology assistances

由政府主管部门及指定的机构为参加合作协议的企业提供上述激励措施，是运行成本低，操作容易，广泛为国外所采用的手段，应成为激励政策的重要组成部分

对于企业，特别是大企业而言，良好的社会形象越来越得到重视

可以预见，这类政策的重要性将越来越大。

激励政策之二：排污收费的减免
Incentives: Exemption and reduction of pollution levy

节能减污合作协议是一个有效的减污手段，在是一个核心问题。在欧洲的许多国家，与节能减污合作协议与税收结合起来，取得了成功

在中国，目前还没有环境税，建立环境税体系和实现税收绿色化的设想正在讨论中，短期内难以实施。而采取对其他非环境税种的减免难度很大

因此，将节能减污合作协议与排污费的减免结合起来，将排污费的减免作为一种激励政策，促进合作协议的实施，是一种很有效的措施

在具体操作上，地方经贸系统和环保系统应密切合作，推动该项工作的开展。首先应由发改委、财政部、环保总局等确定该项政策的基本原则，地方环保系统应确定企业具体的减免税额度，并实施监测和监督。

激励政策之三：总量控制和许可制度中的优惠待遇
Incentives: Preferential treatment in total load control and permit system

总量控制和许可制度，是我国环境保护政策体系中继浓度控制之后新的政策体系。这一制度在国外已经得到应用，并取得了良好的效果。我国环保政策体系正在向总量控制和许可制度转变。将合作协议制度与总量控制和许可制度结合起来，可能是一种有效的措施。

给予参与合作协议，并承诺为实现一定节能减污目标的企业在排污总量分配和许可方面以一定优惠

本项工作同样需要经贸部门和环保部门的有效合作。

激励政策之四：与标志和认证等制度的结合
Incentives: Joint application of CAs, label and verification system

各种环境标志、节能标志，以及清洁技术认证、清洁产品认证等正在逐步成为环境和能源领域的重要政策手段，我国的《清洁生产促进法》等相关法律中也有具体的规定。

节能减污合作协议可以与这些政策手段结合起来，对于参与合作协议同时又获得上述标志的企业的产品，可以在标志上增加相关说明。参与合作协议的企业也应在各种认证的获取和宣示中，获得特定的待遇

激励政策之五：财政手段
Incentives: Financial instruments

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

对签订合作协议企业研究的节能、环保技术改造、投资回收期短、经济效益、社会效益显著的项目，[illegible]

激励政策之六：税收手段
Incentives: Taxation

[illegible]

[illegible]

[illegible] 自2001年1月1日起，[illegible]

所得税：企业利用废气、废水、废渣等废弃物为主要原料进行生产的，可在五年内减征或免征所得税等

[illegible]

激励政策之七：减少对企业的核查、审核、评估
Incentives: Reduction of inspection, audition, evaluation, etc.

企业参与合作协议，是企业和政府互信的表现，对于这种企业，可以实施一定的减少环境和能源等领域的核查、审核和评估的措施

这项工作需要地方经贸主管部门与环保等其他部门协调起来，提出相应的减免清单，并根据参与合作协议的企业的特定情况，将减少核查、审核、评估等的规定列于协议中

合作协议的立法建议

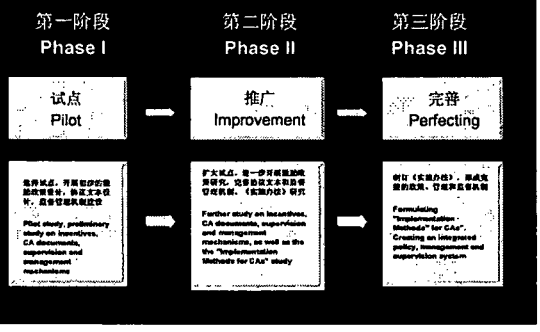
为推动合作协议的有效实施，需要在程序等方面进行具体而详细的规定，便为该项工作的开展提供规范性要求。

《节能与减污合作协议实施办法》（建议稿）

- 总则
- 节能与减污合作协议的申报和签订
- 实施、监督和管理
- 节能与减污合作协议的鼓励措施
- 罚则
- 附则

谢谢！
Thanks

合作协议的实施
Implementation of CAs



合作协议的实施
Implementation of CAs

实施方案设计应遵循的原则

- 属地化管理
- 尽可能发挥现有政策的作用
- 综合发挥政府、企业、公众和中介组织的作用
- 应有清晰和可操作的程序

实施要点

- 组织机构的创建
- 节能与减污目标的制定
- 激励政策的选择
- 程序和评估指标体系的建设
- 法规的制订

annex 9.8.8

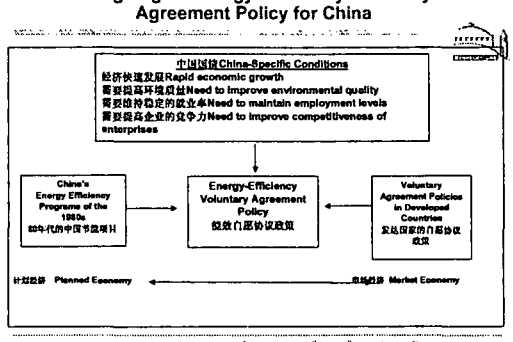
Energy Efficiency Voluntary Agreement Pilot Project in Shandong Province
山东节能自愿协议试点项目

UNDP/GEF Energy Conservation and Greenhouse Gas Emissions Reduction in Chinese Township and Village Enterprises – Phase II
中国乡镇企业节能与温室气体减排 项目二期
Workshop on Energy Efficiency Voluntary Agreements

节能自愿协议研讨会
2004年3月30日

Lynn Price
Energy Analysis Department
Environmental Energy Technologies Division
Lawrence Berkeley National Laboratory

中国行业节能目标政策的设计
Designing an Energy-Efficiency Voluntary Agreement Policy for China



中国工业节能政策项目
China Industrial Energy Efficiency Policies Project

- 项目目标：为在市场转轨条件下制定中国工业部门的能效政策，建立政策框架及相应的实施条例。
  Project goal: develop a policy framework and associated implementing regulations required to establish a comprehensive industrial sector energy efficiency policy in China under changing market conditions
- 广泛调研国外工业行业政策
  Extensive review of international industrial sector policies
  - 法规/标准/税收 Regulation/Standards/Taxation
  - 协议/目标 Agreements/Targets
  - 报告/基准 Reporting/Benchmarking
  - 审计/评估 Audits/Assessments
  - 信息传播和示范 Information Dissemination and Demonstration

中国工业节能政策项目
China Industrial Energy Efficiency Policies Project

- 政策评估组对各行业的以下方面进行了评价：
  For each sector, the Policy Review Team evaluated:
  - 节能潜力 Energy efficiency potential
  - 大型企业的数量 Number of large enterprises
  - 节能技术知识 Technical knowledge of energy efficiency
  - 行业的力量：组织、管理、协会
    Sector strength: organization, management, associations
  - 其他益处：减少污染，节水等 Other benefits: reducing pollution, saving water, etc.
  - 加入WTO对行业竞争力的影响 Implications vis-à-vis WTO competition

Policy Review Team chose Iron and Steel sector for pilot
政策评估组选择钢铁业为试点行业

中国工业节能政策项目
China Industrial Energy Efficiency Policies Project

- 工业行业政策国际研讨会
  International workshop on industrial sector policies
- 建立政策评估组
  来自前各部委、清华大学、前计委能源所以及北京能效中心的专家
  Establishment of a Policy Review Team:
  Experts from former Ministries, Tsinghua University, Energy Research Institute and Beijing Energy Efficiency Center

政策评估组选择自愿协议作为试点政策
Policy Review Team chose Voluntary Agreements as the Pilot Policy

中国工业节能政策项目
China Industrial Energy Efficiency Policies Project

- 政策评估组评估了5个候选地区
  Policy Review Team evaluated 5 potential locations
  - 山东、上海、江苏、辽宁、河北
    Shandong, Shanghai, Jiangsu, Liaoning, Hebei
- 政策评估组对每个地区进行了以下方面的评估：
  For each location, the Policy Review Team assessed:
  - 是否出台了地方实施节能法的配套法规 Local EC Law implementing regulations
  - 节能的积极性 Active in energy conservation
  - 钢铁行业企业的数量 Number of industrial enterprises in the steel sector
  - 是否有能源管理公司EMC Presence of an energy management company
  - 是否有节能中心 Presence of an energy conservation center

Policy Review Team chose Shandong Province for pilot 政策评估组选择山东省为试点省份

济 钢 Jigang

- 建于1958年 Built in 1958
- 年产钢材3百万吨 Produces 3.0 million tons steel per year
- 靠近山东省省会Located near capital of Shandong Province
- 受益于与省政府的紧密关系 Benefits from a close relationship with the Provincial government

自愿协议:关键因素
Voluntary Agreements: Key Elements

• 节能潜力评估	•Assessment of energy-efficiency potential
• 制定扶持性政策与项目	•Establishment of supporting policies and programs
• 目标设定：长期目标	•Target-setting: long-term targets
• 自愿协议合同	•Voluntary Agreement contract
• 实施计划	•Implementation plan
• 年度监测与评估	•Annual supervision and evaluation

莱 钢 Laigang

- 建于1970年 Built in 1970
- 年产钢材250万吨 Produces 2.5 million tons steel per year
- 通过采用先进的管理模式获得了亚洲发展银行同世界银行赞助的能源管理中心的能效投资 Modern management style used to obtain capital from Asian Development Bank and World-Bank sponsored Energy Management Center for energy-efficiency investments

自愿协议:定义
Voluntary Agreements: Definition

处工业企业与政府间的协议，二者通过此协议达成共同的长期节能目标，并通过特别的支持政策来实现。

Agreement between an industrial enterprise and government that establishes a mutually agreed upon target for energy-savings over a long-term period given specified supporting policies

- 就特定的目标进行磋商并签署协议
  Signed, negotiated agreement with specific targets
- 长期规划（通常为5-10年）
  Long-term outlook (typically 5-10 years)
- 政府的扶持性政策帮助企业达到目标
  Government supporting policies assist enterprises in reaching targets
- 协议中包括实现目标的实施计划
  Includes an implementation plan for reaching the targets
- 包括为实现目标而制定的年度监督程序
  Includes annual monitoring of progress toward the targets

山东省企业节能自愿协议的试点方案
Shandong Enterprise Energy Efficiency Voluntary Agreement Pilot Plan

- 2003年4月24日，山东经贸委与莱钢、济钢签署了自愿协议
  Voluntary agreements between Shandong Economic and Trade Commission and Laigang and Jigang were signed on April 24, 2003
- 设立了2005年节能目标
  Targets are set for 2005
- 省经贸委成立了山东省企业节能自愿协议指导小组，负责组织指导试点工作
  Shandong ETC established a Shandong Enterprise Energy Efficiency Voluntary Agreement Leadership Group which is responsible for organizing and directing the work of the pilot program
- 建立了山东企业能效自愿协议监督与审计小组
  Shandong Enterprise Energy Efficiency Voluntary Agreement Monitoring and Auditing Group was established

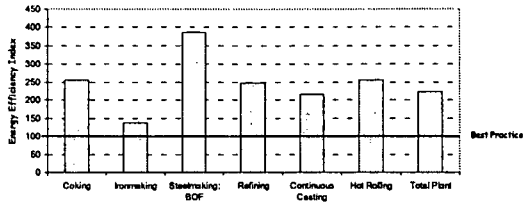
自愿协议:基本理念
Voluntary Agreements: Philosophy

- **行政命令和管制的方法已经过时**
  Command-and-control approach is out-dated
  - 建立政府与企业间的敌对关系
    establishes an antagonistic relationship between government and industry
  - 政府规定的某些活动对于一些企业来讲或许比较困难
    government dictates specific actions that may be difficult for some industries
- **自愿协议方式具有创新性**
  Voluntary agreement approach is innovative
  - 建立政府与行业间积极的工作关系
    establishes a positive working relationship between government and industry
  - 工作目标一致，例如节能或防止污染
    work toward mutual goals such as energy savings or pollution prevention
  - 减少成本，提高灵活性
    reduces costs, increases flexibility

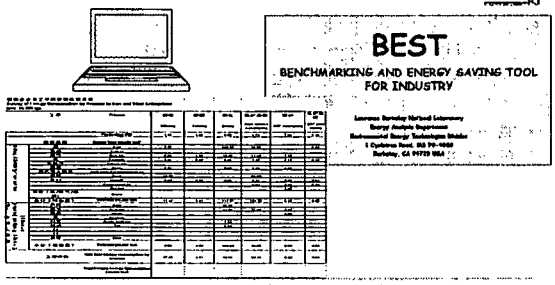
企业节能潜力评估
Assessment of Enterprise Energy-Efficiency Potential

- 按照生产程序测定当前的年度能耗量以及能耗强度
  Determine current annual energy consumption and energy intensity by process step
- 根据钢铁生产的最佳实践制定能耗强度基准
  Benchmark energy intensity to "best-practice" iron and steel production
- 计算能效指标以测量一般企业与最佳企业之间能效的差距
  Calculate the energy efficiency index to measure the difference between the enterprise and the "best practice" plant

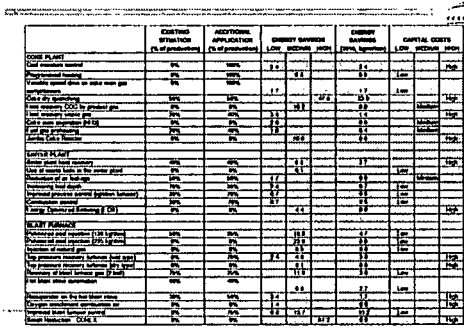
企业节能潜力评估
Assessment of Enterprise Energy-Efficiency Potential



企业节能潜力评估
Assessment of Enterprise Energy-Efficiency Potential



企业节能潜力评估
Assessment of Enterprise Energy-Efficiency Potential



能效指数合成（EEI）
Aggregated Energy Efficiency Index (EEI)

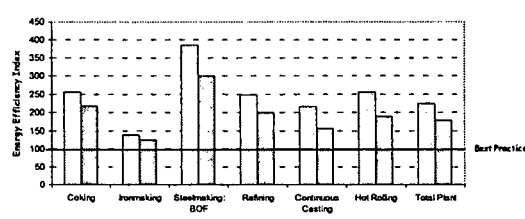
$$EEI = 100 * \frac{\sum_{i=1}^{n} P_i \cdot EI_i}{\sum_{i=1}^{n} P_i \cdot EI_{i,B}} = 100 * \frac{E_{tot}}{\sum_{i=1}^{n} P_i \cdot EI_{i,B}}$$

其中：
EEI = 能效指数（100%）
N = 被统计的工序数
EI_i = 第i项工序的实际能耗（EI）
$EI_{i,B}$ = 第i项工序的能耗（EI）基准
P_i = 第i项工序的产量
E_{tot} = 所有统计工序的实际总能耗

Where:

EEI	= energy efficiency index
n	= number of process steps to be aggregated
EI_i	= actual energy intensity (EI) of process step i
$EI_{i,B}$	= benchmark energy intensity (EI) of process step i
P_i	= production quantity for process step i
E_{tot}	= total actual energy consumption for all process steps

企业节能潜力评估
Assessment of Enterprise Energy-Efficiency Potential

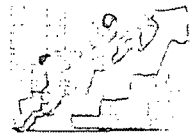


扶持性政策与项目
Supporting Policies and Programs

- 资金资助
  Financial assistance
- 有目标的减税
  Targeted tax reductions
- 企业自我监督
  Enterprise self-monitoring
- 简化的规则
  Streamlined regulation
- 合同优先权
  Preference for contracts
- 政府与公众的认同
  Government and public recognition
- 信息公开与信息传播
  Open information access and information dissemination

目标设立
Target-Setting

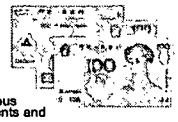
- 关键是设立一个既宏远又现实的目标
  Key is to set ***ambitious, yet realistic targets***
- 一定要高于常规情况
  Must be more than business-as-usual
  好于以往的趋势
  Better than past trends



扶持性政策与项目：山东省
Supporting Policies and Programs: Shandong Province

在现有优惠政策下，优先考虑两个试点企业 Give priority consideration to the two pilot enterprises under existing preferential policies.

由省级担保公司协调担保人条款，以保障试点企业能效项目中的贷款和其他金融活动的顺利进行
Coordinate the provision of guarantees by the provincial guarantee company for loans and other financial activities required for energy-efficiency projects at the pilot enterprises.



广泛调动媒体，宣传节能成果和试点企业成绩 Use various media to publicize the energy-conservation achievements and contributions of the pilot enterprises.

建立中介机构，为试点企业提供相应政策、技术、管理和建议等服务 Organize intermediary organizations to provide the pilot enterprises with policy, technical, management, and other advice and services.

通过监测和评价试点企业的能源应用状况进行筛选 Upon evaluation, exempt the pilot enterprises from monitoring of the status of energy utilization.

目标的形式？
What kind of targets are there?

- 具体目标 Specific targets
  相对的 Relative
  绝对的 Absolute
  基准 Benchmarks
- 绝对目标 Absolute targets
  绝对能源消耗 Absolute energy use
  绝对CO_2排放 Absolute CO_2-emissions
- 经济目标 Economic targets
  经济效益（社会角度）
  Cost-effectiveness targets (social perspective)
  赢利目标（商业角度）
  Profitability targets (business point-of-view)

扶持性政策与项目：山东省
Supporting Policies and Programs: Requested from National Government

鉴于节能项目所达到的效果，根据综合利用能源的政策，进行一系列优惠政策的研究并提出建议，以鼓励节能 For energy-conservation benefits realized through energy-conservation projects, and in accordance with resources comprehensive-utilization policy, investigate and propose recommendations for preferential policies to encourage energy conservation.

对满足国家优惠政策条件的试点企业，将优先支持其项目实施 Give priority support to projects undertaken by the pilot enterprises that fulfill the criteria set by national preferential policies.

对试点企业中在能效、综合利用、还款时间、经济社会效益方面有突出成绩的项目授予一定的研发经费，以支持企业开展能效研究与发展 Grant a portion of research and development costs for projects undertaken by the pilot enterprises that have significant results in energy and resource conservation and comprehensive utilization, short payback times, and outstanding economic and social benefits, to support enterprises to carry out energy-conservation research and development.

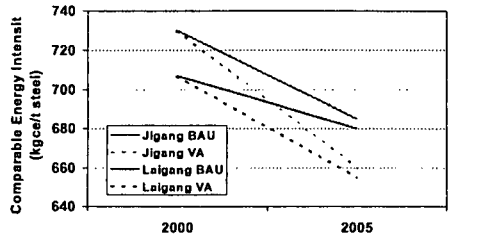
在引进外国投资方面，优先考虑试点企业 Give priority to the pilot enterprises when bringing in foreign investment capital.

授予试点企业"中国能效自愿协议试点企业"的荣誉称号 Award pilot enterprises the honorable title of "China Energy-Efficiency Voluntary Agreement Pilot Enterprise".

山东省企业节能自愿行动试点方案
Shandong Enterprise Energy Efficiency Voluntary Agreement Pilot Plan

	2000	2005	节能率（年） Energy Conservation Rate
济钢 Jigang			
单位产品能耗Comprehensive energy intensity (kgce/t)	813	735	-2.0% per year
单位产品能耗 Comparable energy intensity (kgce/t)	730	660	-2.0% per year
莱钢 Laigang			
单位产品能耗 Comprehensive energy intensity (kgce/t)	872	715	-3.9% per year
单位产品能耗 Comparable energy intensity (kgce/t)	707	655	-1.5% per year

山东省自愿协议试点项目2005年目标
Shandong Province Pilot VA Targets 2005



实施计划
Implementation Plan

- 实施计划包括：
  Implementation Plan includes:
  - 企业能源状况的描述
    description of the enterprise with respect to energy
  - 所考虑到的提高能效措施的描述
    description of the energy-efficiency measures considered
  - 计划进行的提高能效措施的描述
    description of the planned energy-efficiency measures
  - 提高能效措施的时间框架
    timeframe for implementation of the energy-efficiency measures
  - 所希望的能效结果
    expected results in terms of energy efficiency

自愿协议合同
Voluntary Agreement Contract

- 由协议各方签署 Signed by the parties to the agreement
  - 企业 enterprises
  - 政府 government
- 合同内容包括 Contract covers
  - 协议各方的责任
    responsibilities of the parties to the agreement
  - 项目的节能目标
    project energy conservation targets
  - 项目日程安排
    project schedule
  - 监督与检验程序
    monitoring and verification procedures

监测与评估
Supervision and Evaluation

- 来自企业、政府与其他机构的代表组成团队负责监测与评估
  Team comprised of representatives from enterprise, government, and other organizations responsible for supervision and evaluation
- 由企业准备年度监测报告
  Annual Supervision Reports prepared by enterprises
- 需要时修改节能计划
  Modifications to the Energy Conservation Plan if needed
- 年度评估
  Annual evaluations
- 最终评估
  Final evaluation

节能自愿协议签字仪式
Voluntary Agreement Signing Ceremony

监测与评估
Supervision and Evaluation

- 年度监测报告包括：
  Annual supervision report includes:
  - 年度产量与每个程序耗能量
    annual production and energy consumption by process
  - 实现目标的步骤的评估
    assessment of progress toward target
  - 能源管理方法及其效果
    energy management measures and their effects
  - 能效提高项目及其效果
    energy-efficiency improvement projects and their effects
  - 其他提高能效的项目
    other projects that have led to energy-efficiency improvements

自愿协议项目的效果
Effectiveness of Voluntary Agreement Programs

- 7个自愿协议项目回顾
  Review of 7 VA programs
  - 50%的可见的能效提高与减排均归因于自愿协议项目
    50% of observed energy-efficiency improvement or emissions reductions was due to the VAs
  - 其他的效果还包括意识的提高、管理的改进、市场转换、技术革新、对于非能源效益的理解、政策的学习、受训专家人数的增多以及交易成本的减少
    Other effects include improved awareness, management practices, market transformation, technological innovation, understanding of non-energy benefits, policy learning, increased number of trained specialists, reduced transaction costs

中国其他的自愿协议项目
Other Voluntary Agreement Projects in China

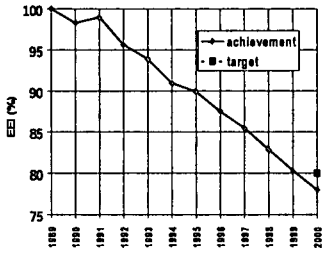
- 中国钢铁协会：可行性研究：能效资源协议在中国钢铁业中的应用China Iron and Steel Association: Feasibility Study: Use of Energy Conservation Voluntary Agreements in the Chinese Steel Industry
- 中国环保局、中国环境友好基金项目：在五个省份的石化与化学工业试点项目
  China State Environmental Protection Administration (SEPA) China Environmental Friendly Facility (CEFF) program for petrochemical and chemical sectors in five pilot provinces
- 15个企业与青岛市经济委员会的自愿能源协议 Qingdao City voluntary energy agreements between 15 enterprises and the city's economic commission:
  - Tsingdao Haier Group, Huangdao Power Plant, Tsingdao Huanghai Rubber Group, Ltd., Jimo Cogeneration Power Plant, Tsingdao Haijing Chemical Group, Ltd., Tsingdao Kaiyuan Group, Ltd., Tsingdao Cigarette Factory, Tsingdao Soda Company, Ltd., Tsingdao Lianchuang Company, Ltd., Tsingdao Petro-chemical Plant, Tsingdao Bear Plant, Tsingdao Cogeneration Company, Ltd., Tsingdao Taineng Gas Company, Ltd., Tsingdao Iron and Steel Company, Ltd., Tsingdao Power Plant

自愿协议项目的效果
Effectiveness of Voluntary Agreement Programs

- 荷兰的长期协议
  Netherlands Long-Term Agreements

自愿协议中有90%与工业部门签界，目标是在1990至2000年中提高能效20%，实际达到的比率为22.3%，25%到50%，在不同的行业都超出常规状况

VAs signed with 90% of industrial sector, target was 20% improvement of energy efficiency over the period 1990 – 2000, actually achieved 22.3%, 25% to 50% beyond business-as-usual, depending upon the industry



如果需要更多的信息...
For More Information...

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http://eetd.lbl.gov/EA/partnership/China/index.html

劳伦斯伯克利国家实验室工业站点
LBNL Industrial website:
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中国其他自愿协议项目
Other Voluntary Agreement Projects in China

- 联合国开发计划署（UNDP），全球环境基金（GEF），联合国工业发展组织（UNIDO）和农业部"中国乡镇企业节能及温室气体减排项目：水泥、制砖、铸造和炼焦行业
  UNDP, GEF, UNIDO, MOA, Energy Conservation and Greenhouse Gas Emissions Reduction in Chinese Township and Village Enterprises: cement, brick, metal casting, and coking sectors
- UNDP/GEF终端能效项目：钢铁、化学和水泥行业
  UNDP/GEF End-Use Energy Efficiency Program (EUEEP): iron and steel, chemical and cement sectors
- 北京大学环境科学学院"节能与污染减排自愿协议政策方法"研究项目，其目的在于制订与自愿协议相关的《节能法》实施条例
  Beijing University College of Environmental Sciences project "Study on Policy Measures for Voluntary Agreements in Energy Saving and Pollution Reduction" to develop Energy Conservation Law implementing regulation

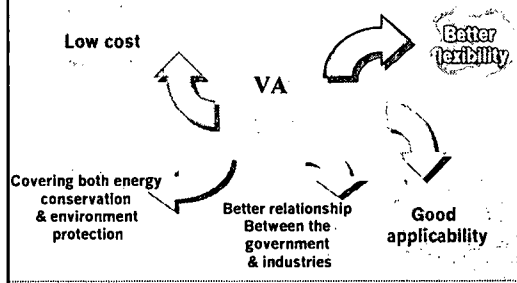
Annex 9.8.9

Progress and Analysis of VA Pilot Projects in China

Jiang Yun

China Energy Conservation Association

I. Characteristics of VA



I. Characteristics of VA
II. Examples of VA projects in China
III. Comparison of the VA pilot projects
IV. Activities carried out for promoting VA in China
V. Recommendations on pilot projects

II. Examples of VA projects in China

- VA pilot project for energy conservation in Shandong Iron & Steel Industry
- **UNDP/GEF project of Energy Conservation and Emissions Reduction in Chinese TVEs, executed by UNIDO & implemented by MOA**
- **VA in Qingdao City**

I. Characteristics of VA

VA is meant for stronger role of industries in energy conservation under the guidance of the government. Driven by their own interests, the government and industries signed the agreement voluntarily, or industries, "voluntarily" rather than forced by laws and regulations, commit themselves to energy conservation and environmental protection.

VA Pilot Project in Shandong Iron & Steel Industry

On April 22, 2003, Shandong Provincial Economic and Trade Commission signed voluntary agreement for energy officiency with Jinan Iron & Steel Factory and Laiwu Iron & Steel Factory, marking the beginning of VA application in China.

VA Pilot Project in Shandong Iron & Steel Industry

- *Project duration* 2003-2005
- *Project Objectives*
  - To establish a mechanism to organize and monitor energy efficiency VA application
  - To establish a system to set indicators and evaluate performance in energy efficiency and environmental protection
  - To establish a system to set target for energy efficiency and environmental protection
  - To establish a system supporting energy efficiency VA
- *Indicators*

  13 indicators covering energy efficiency, environmental protection and economic indexes

  EEI not included as indicator

Energy Conservation and Emissions Reduction in Chinese TVEs

- Action Plan is developed after LPICs are established, and then VA is signed between pilot TVEs and the local governments.
- The actual situation of Chinese TVEs are taken into full consideration.
- Drafts of VA developed at the following pilot sites.
  - Lufeng Cement Co Ltd, Tieshan District, Huangshi, Hubei
  - Moling Metal Casting Factory, Jiangning, Nanjing, Jiangsu Province
  - Yongxin Shale Bricks Co Ltd, Xinjin, Chengdu, Sichuan Province

VA Pilot Project in Shandong Iron & Steel Industry

- *Target seeing*

  Targets are set for energy efficiency by the end of 2003 and of 2005, with 2002 as the base year.

- *Supporting incentives*
  - *Priority is given to the participating enterprises in terms of existing preferential policy for energy efficiency*
  - Coordination is done for participating enterprise to access to finance for technical upgrading
  - Participating enterprise is exempted from examination of energy utilization status.
  - Participating enterprise has easy access to technical support and information services.
  - Participating enterprise is awarded with honorable title.

VA in Qingdao

15 companies in Qingdao (like Hai'er and Qingdao Power Plant) has signed VA with the Municipal Economic Commission by Nov. 5, 2003.

They make up 72% of the city's total energy consumption in the major energy intensive companies.

Target set: By 2005, an aggregated energy saving of 285,000 tons based on comprehensive consumption for production, or a saving of RMB160mn, and in emission reduction, 4911 tons for sulfur dioxide, and 170,000 tons for carbon dioxide.

A workshop is to be held in Qingdao this April to review the progress.

VA Pilot Project in Shandong Iron & Steel Industry

- *Progress*
  - *Institutional building almost completed*
  - Performance evaluation system established, participating enterprise has formulated VA Management Procedure and Regulations on Award and Penalty in Energy Conservation
  - Some indicators are not fulfilled as a result of increased raw material cost.
  - Executives of participating enterprise is improved in awareness of energy efficiency, and the binding force of VA is playing an important role now.

A workshop is to be held in Shandong in April this year to review the project progress.

III. Comparison and analysis of VA projects

1. Different priorities

2. Investigation made for the projects, completeness of project plan

3. Enforcement of supporting policies

4. Various indicators make it difficult to measure the VA result. EEI is thus recommended.

III. Comparison and analysis of VA projects

5、Self examination and expert examination

6、Special institution is recommended for better execution of VA.

7、Sustainability of the projects

8、Project publicity to be strengthened

IV. Publicity activities

Observations after surveys

- **Huge potential of energy conservation in the oil industry: Daqing Oilfield accounts for 1% of the country's total energy consumption. Take its No. 5 oil exploration factory as an example, 1% electricity saving is equal to 6mn KW.**
- **Good financial situation with giant state-owned enterprises, making it easier to explore VA application.**

IV. Publicity activities

Newsletter of VA pilot projects

Reporting progress of VA pilot projects, giving timely VA information from pilot enterprises, the central and local governments, authorities concerned, national and international experts

IV. Publicity activities

- *Latest news relating to VA available on the website:***www.cecaweb.org.cn**
- *Promoting VA at various workshops and seminars both at home and abroad*

the 13th National Energy Conservation Publicity Week in Nov. 2003

IV. Publicity activities

Tours to companies

- PetroChina Fushun Petrochemical Co: in Dec. 2003, introducing energy efficiency VA and VA pilot project in China
- Daqing No.5 Oil Exploration Factory: in March 2004, VA workshop attended by over 30 participants

Following activities

- Surveys to be carried out of the energy intensive industries in Jiangsu and Hunan provinces
- VA Replication Promoting Conference in the coming May to be attended mainly by potential participants in VA application

Recommendations on VA projects

1、*More areas should be covered for quicker exploration of VA application with Chinese characteristics.*

2、*Since most of enterprises in China are more or less the same in capacity, nature, etc., different application programs should be developed for different industries on the basis of surveys. Different means should be applied to arouse enterprises's interest in energy efficiency improvement.*

3、*Indicators should be given for different industries to evaluate VA application result.*

4、*Unified standards should be applied for evaluation of VA projects.*

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中国部分行业节能减排潜力及世界自然基金会（WWF）企业自愿减排活动框架

Potential of Energy Conservation and Emission Reduction in some Chinese Industries & Framework of Enterprise's Emission Reduction Voluntary Activities (WWF)

中节蓝天投资咨询管理有限责任公司

CECIC Blue-Sky Investment Consulting& Management Co. Ltd.

一、自愿协议国内外开展情况

Implementing Status on Voluntary Agreement throughout the World and in China

1.基本概念

Basic Concept

2.国外自愿协议开展情况简介

Brief introduction of overseas implementing status on voluntary agreement

项目背景

Project Background

■中节蓝天投资咨询管理有限公司前身为中国节能投资公司咨询部，2002年12月在中国节能投资公司咨询部基础上由中国节能投资公司和中国环境保护公司投资组建成立。

■In December of 2002, on the basis of the former Consulting Department of China Energy Conservation Corporation(CECIC), Blue-Sky Investment Consulting & Management Co. Ltd. (Blue-Sky Co.) was established upon the joint investment of CECIC and China Environmental Protection Corporation.

3.世界自然基金会已开展的自愿协议活动——拯救气候项目（Climate Saver）

Voluntary agreement activities that WWF has already launched--Climate Saver

4.中国自愿协议开展情况

Implementing status of voluntary agreement activities in China

■2003年5月，为配合"世界自然基金会清洁电力行动企业自愿减排活动"的开展，蓝天咨询公司受世界自然基金会的委托，开展了中国六个行业能效现状、节能潜力及节能障碍调查，并在此基础上设计了WWF企业自愿减排活动框架。

■In May of 2003, in order to promote the development of "Enterprise's Emission Reduction Voluntary Activities of WWF Climate Saver Campaign", Blue-Sky Co., entrusted by WWF, made an investigation on the current energy efficiency, energy conservation potential and energy conservation obstacles of six industries in China. Based on the investigation, Blue-Sky Co. has designed the framework of the Enterprise's Emission Reduction Voluntary Activities of WWF.

二、中国部分行业节能减排潜力

——六个行业能效调研情况简介

Potential of Energy Conservation and Emission Reduction of some industries in China

—Brief Introduction of the Investigation on the Energy Efficiency of Six industries

中国正处于经济高速增长和城市化进程加快阶段，能源需求的增长很快，同时节能的潜力也非常大，我们对发电、电网、水泥、大型超市（商场）、饭店和啤酒六个行业能效现状的调研充分说明了这个结论。

With the rapid development of economy and the quickening of the urbanization step, China needs more and more energy and enjoys an ever-increasing potentiality of energy conservation. Our investigation on the current energy efficiency situation of power generation industry, electric grid industry, cement industry, hypermarket (marketplace) industry, restaurant industry and beer industry has effectively supported the aforesaid conclusion.

（2）电网
Electric Grid Industry

■2000年全国电力网经营供电量达到11468.6亿kWh，售电量10573.3亿kWh，电网线损率7.81%，比国际多数发达国家高约1.0～2.3个百分点。

■In 2000, the quantity of business power supply and the electricity sales amount of the whole country had been up to 1,146,860 million kWh and 1,057,330 million kWh respectively. Also in 2000, the electric grid line loss rate of China was 7.81% that was about 1.0-2.3 percentage points higher than that of most developed countries in the world.

（1）发电
Power Generation Industry

■2002年度我国全年发电量总计为16542亿kWh，其中火电为13522亿kWh，占总发电量的81.74%。我国大力发电厂以燃煤为主，燃油、燃气机组容量目前尚不足5%。2002年度我国全国平均发电煤耗大约为353g/kWh，供电煤耗为381g/kWh，供电效率仅为32.2%。2002年度我国发电行业消耗的各种燃煤、燃油以及燃气折合标准煤为4.8亿吨，总的CO_2排放量约为12.4亿吨。

■The total power output of 2002 in China was 1,654,200 million kWh, among which the thermal power output was 1,352,200 million kWh accounting for 81.74% of the total. The thermal power plants of our country rely mainly on fire coal. The fuel oil unit capacity and the fuel gas unit capacity are still no more than 5% of the total at present. In 2002, the average coal consumption of power generation and of power supply was 353g/kWh and 381g/kWh respectively and the average power supply efficiency was only 32.2%. The fire coal, fuel oil and fuel gas that the power generation industry of China had consumed in 2002 is equal to 480 million tons of standard coal. And also in that year, the total emission amount of CO_2 was up to *1,240 million tons.*

■通过加强配电网建设改造，完善网架结构；增加配电网无功补偿等措施，在近期内（2010年前），我国电网降损节能潜力约为1～1.5个百分点，即与2000年相比，综合线损率目标界定在6.2%～6.8%是比较合理的。届时相当于每年少损耗210～330亿kWh电能，相当于每年少耗标煤约840～1300万吨，相当于减排CO_2 2100～3300万吨。

Through strengthening construction and transformation for distribution network, perfecting the grid structure; increasing the reactive compensation of *distribution network and other measures, in the near future (before 2010)*, China will be able to reduce the electric grid line loss rate by about 1-1.5 percentage points. Compared with 2000, it is more rational that the integrated electric grid wastage rate is fixed between 6.2-6.8%. When the time comes, the reduction of the integrated electric grid line loss rate will be equal to reducing electric energy by 21-33 billion kWh, standard coal by 8.4million- 13 million tons and CO_2 by *21 million-33 million tons.*

■通过以大代小、热电联产、机组改造等措施，发电行业的供电煤耗每年以5gce/kWh的速度下降，到2010年我国的供电煤耗大约为350gce/kWh，比2000年的400gce/kWh低50gce/kWh，按保守值30gce/kWh估算，全国每年可节约标煤3326万吨，减排CO_2约0.8亿吨。

■Through replacing small power plants with big ones, cogeneration, machine set reform and other measures, the power generation industry reduces the coal consumption of power supply at a speed of 5gce/kWh per year. By 2010, the coal consumption of power supply will be about 350gce/kWh, which is 50gce/kWh less than 400gce/kWh of 2002. It is estimated that the whole country will be able to save 33,260,000 tons of standard coal and reduce the emission of CO_2 by 80 million each year.

（3）大型超市（商场）
Hypermarket (Marketplace)

※商贸行业通过对照明系统、空调系统、升降设备等用电装置的合理配置和技术改造，可挖掘的节能潜力应在15-20%，按15%的低限计算，每年可以节电9.4-12.6亿kWh，减排$CO_2$94-126万吨　由于节能潜力的推算都采用低限，因此实际的节能潜力和CO_2减排量将更大。

※Through rationally allocating and reforming lighting system, air-conditioner system, elevating equipment, etc, the commercial industry will be able to reduce the consumption of energy by 15-20%. While being calculated according to 15%, the lowest limit, the quantity of the electricity saved will be up to 940-1,260 million kWh and the quantity of CO_2 emission reduction will reach 0.94-1.26million tons. For the calculation adopts the lowest limit, the real potentiality of saving energy and the emission reduction of CO_2 will be greater.

（4）饭店
Restaurant Industry

■饭店宾馆业的节能改造措施主要是改造空调系统，改进照明设计，尽量采用自然光照明和高效照明电器及节电开关；提高锅炉效率，提高燃料质量和运行管理水平等。仅通过客房采用高效照明电器和改造空调系统，每年就可节电9.6亿kWh，相当于减排$CO_2$96万吨。

■There are many effective energy-conservation measures that can be adopted by restaurant and hotel industry such as transforming air-conditioner system, improving lighting system, adopting natural-light illuminating lamps, high-efficient illuminating lamps and power-conservation switches, raising the efficiency of boiler, improving the quality of fuel, improving the operation management level, etc. Only by adopting high-efficient illuminating lamps and transforming the air-conditioner system in guest rooms, the whole industry will be able to save electricity by 960 million kWh and reduce the emission of CO_2 by 960,000 tons.

（5）水泥
Cement Industry

※我国已经成为水泥生产大国，2002年水泥产量已达7亿吨，居世界首位，但水泥行业企业规模普遍偏小；产品结构不合理，低标号水泥产量大；生产工艺落后，能源消耗大，经济效益低。因此，我国还不是一个水泥工业强国。

※China has already been a big country producing cement, the output of which had been up to 700 million tons in 2002, which was ranked No.1 in the world. For the scale of most cement enterprises of China is somewhat small, the product structure of them is unreasonable, the output of low-grade cement is too large, the production technology still lags behind, the consumption of energy is too great and the economic benefit is relatively low, China is still cannot be regarded as a powerful country in the cement industry.

■通过发展新型干法水泥、淘汰小立窑、提高混合材掺加量、提高水泥散装率、综合利用天然资源和提高水泥质量等措施，每年的节能潜力分析能达到节约标煤5900万吨，相当于减排$CO_2$1.5亿吨。

■Through developing new-type dry-processing cement, abandoning small vertical kilns, increasing the content of composite material, increasing cement in bulk, comprehensively utilizing natural resources, improving the quality of cement, etc., the cement industry of China will be able to save 59 million tons of standard coal each year. In other words, the cement industry will be able to reduce the emission of CO_2 by 150 million tons per year.

（6）啤酒
Beer Industry

■2002年我国啤酒产量2387万吨，比上年增长近5%，首次超过美国，成为世界第一啤酒生产大国。2002年我国啤酒行业耗电总量为25亿kWh，耗标煤300万吨。如果每年能耗水平降低1%，则可节电2537万kWh，节标煤3万吨，相当于每年减排$CO_2$10万吨。

■The output of beer of China in 2002 was 23,870,000 tons which had been increased by nearly 5% compared with that of last year and which had exceeded that of U.S.A. for the first time making China become the biggest country producing beer in the world. The beer industry of China totally consumed 2,500 million kWh of electricity and 3 million tons of standard coal in 2002. If the energy-consumption level can be reduced by 1% in each year, then, the beer industry will be able to save 25,370,000 kWh of electricity and 30,000 tons of standard coal per year. In other words, the beer industry will be able to reduce CO_2 emission by 0.1 million tons each year.

经初步调查，仅上述六个行业通过采取一系列节能技术措施，到2010年就能节约标煤1.1亿吨，实现CO_2减排约2.7亿吨，中国节能减排潜力巨大。

According to a preliminary investigation, the above mentioned six industries will be able to save 110 million tons of standard coal and reduce CO_2 emission by 270 million tons by 2010 only through adopting a series of energy-conservation measures. Therefore, China enjoys a huge potentiality of energy conservation and CO_2 emission -reduction.

—在中国开展自愿减排活动是节能增效，实现CO_2减排的双赢选择

Developing emission reduction voluntary activities in China is a win-win choice for Chinese enterprises to save energy and reduce the emission of CO_2

短期内，中国电力70%以上来自煤电的大格局和位居世界CO_2排放国第二的地位不会有大的改变，这一点决定了要减缓全球温室气体排放的步伐，仅仅依靠发达国家的限控是难以达到的。中国节能工作对全球CO_2减排具有重大的影响。

In a short term, the situation that more than 70% of China's electricity comes from coal and the emission amount of CO_2 of China keeps the second largest in the world will not been changed too much. Therefore, it is difficult to reduce the emission amount of the global greenhouse gas only by regulating developed countries. The energy conservation work of China is meaningful for reducing the emission amount of CO_2.

■通过开展各类节能工作，中国不仅可以因节能降耗降低成本，取得较大的经济效益，同时，也可以大大改善环境污染状况，形成巨大的减排CO_2潜力。因此，在中国开展自愿协议活动，并将其纳入中国政府、行业和企业的节能增效活动中，一方面可以改善中国企业的技术装备水平和市场竞争力，另一方面又能有效实现CO_2减排的国际目标，是一个双赢的选择。

■Through carrying on all kinds of energy-conservation work, China will be able to not only lower the cost of production and make a greater economic benefit for the saving of energy and the reduction of consumption, but greatly improve the environmental pollution state and form an enormous potentiality of reducing the emission of CO_2. Therefore, developing voluntary agreement activities in China and introducing them into the energy conservation activities of the Chinese government and all kinds of industries and enterprises is win-win choice for Chinese enterprises to improve the technical level and the market competitiveness of Chinese enterprises and realize the goal of reducing the emission amount of CO_2 effectively.

1.经济障碍或经济发展阶段障碍

1. Economic obstacles or the obstacles at the economic development stage

■中国是发展中国家，现阶段中国企业首先追求的是经济效益，目前中国对于节能减排的经济激励或惩罚力度不够，企业参与的积极性不高。

■China is a developing country and pursuing economic benefits is the first goal of Chinese enterprises at the present stage. At present, China takes not too many encouraging and punishment measures for saving energy and reducing the emission of CO_2 and the enthusiasm of enterprises for participating in the activities is not high.

三、中国开展企业自愿减排活动的主要障碍分析

Main Obstacles in Implementing Enterprise Emission Reduction Voluntary Activities in China

中国这样的发展中国家开展企业自愿减排CO_2的活动，与欧美发达国家开展类似活动既有共同点，更存在着差异。

As a developing country, China enjoys many common points with American-European developed countries while carrying on enterprise emission reduction voluntary activities. However, the different points among them are even more.

2.政策障碍

Policy Obstacle

■中国目前尚缺乏具体、可实施的节能政策，法律,法规、财税优惠政策以鼓励开展节能减排的企业，惩罚未采取措施的高耗能、高排放企业，开展节能减排工作的阻力较大。

■At present, China still lacks concrete and enforceable energy-conservation policies, laws, regulations and financial preferential policies that can encourage the enterprises attaching importance to energy-conservation and emission-reduction and punishing the enterprises taking no measures to reduce consumption and discharge amount. Therefore, the obstacle that China faces while carrying on the energy conservation and emission reduction work is relatively great.

■深刻认识自愿协议在国内外开展存在的异同，以及中国存在巨大的减排CO_2的潜力，有助于充分理解在中国开展自愿协议活动的主要障碍，并因地制宜地提出中国企业自愿减排活动的宣传推动方针。

■Deeply realizing the similarities and differences between China and foreign countries in voluntary agreement activities and the huge CO_2 emission-reduction potential that China enjoys will enable decision-making organ of China to fully understand the main obstacles that China face while developing voluntary agreement and put forward a promotion guideline for the emission reduction voluntary activities of Chinese enterprises according to the reality.

3.技术信息障碍

Technological Information Obstacle

■缺乏节能技术、产品以及节能政策、节能国家标准、经验等信息的交流和人员培训，企业领导很难把节能工作提到议事日程上来。

■For the lacking of information exchange in respect of power-saving technology, products, energy conservation policy, national energy conservation standard, experience, etc. as well as staff training, it is difficult for enterprise leaders to really and effectively carry out the energy conservation work.

四、WWF企业自愿减排活动框架

Framework of Enterprise's Emission Reduction Voluntary Activities(WWF)

3. 活动的时间、范围和实施步骤
Time, Range and Implementation Steps

❖第一期5年时间，争取在中国5大行业（电厂、电网、饭店、大型超市（商场）、水泥）逐步建立一些自愿协议示范企业。

❖First Stage: 5 years, try to set up some pilot enterprises of voluntary agreement progressively in 5 Chinese large industries (power generation industry, electric grid industry, restaurant industry, hypermarket (marketplace) industry and cement industry).

1. 活动宗旨
Activity Tenet

❖在促成一些企业签订自愿协议的同时，广泛宣传自愿协议节能降耗新机制，引导、推进中国节能减排自愿协议的开展，使广大中国企业认识并接受自愿协议，鼓励更多的中国企业加入到自愿减排的活动中来。

■While facilitating some enterprises to sign the voluntary agreement, extensively disseminate the new voluntary energy conservation mechanism, guide and promote the development of voluntary agreement in China, make the masses of Chinese enterprises know and accept the voluntary agreement and encourage more Chinese enterprises to participate in the voluntary agreement activities.

实施步骤：5个行业分阶段逐步展开。

Implementation Steps: carry out the activity in 5 industries step by step

■详细的活动方案仍在设计之中

The detailed activity scheme is still under design

2.实施方针
Implementation Guideline

■与中国政府有关主管部门、行业协会或企业联合，在其已经开展的节能降耗工作基础上，引入自愿协议新方式。通过合作，推动WWF自愿减排协议在中国的开展。

■Cooperating with relevant authorities of the Chinese government, industries societies or enterprises, introduce the new method of voluntary agreement into China on the basis of the energy-conservation and consumption-reduction work already carried out. Through cooperation, promote the development of "WWF Emission Reduction Voluntary Activities" in China.

4.中国企业参与WWF自愿减排活动可获得的利益

The benefits Chinese enterprises participated in the Enterprise's Emission Reduction Voluntary activities (WWF)

（1）通过节约能源、保护环境和降低生产成本，增加企业竞争力。

The enterprises can increase their competitiveness through saving energy, protecting environment and reducing production cost.

（2）无须增加企业的广告成本，通过WWF的广泛宣传活动，可大大提升企业的公众形象，证实企业具备强烈的社会责任感，加强社会对企业的认知度。

The enterprises can greatly improve their public images, show the strong sense of social responsibility that they possess and popularize themselves through the wide promotion activities of WWF and without increasing the advertising cost.

（3）可以得到WWF提供的各种技术和信息服务，及时了解国内外最新节能减排技术动态，并得到同行业间经验交流的机会。

The enterprises can obtain various kinds of technology and information services offered by WWF, understand the latest dynamic of energy-conservation technologies both at home and abroad timely and get the chance to exchange experience among the same industry.

（4）有机会成为WWF企业联盟成员，与世界知名企业并列，提升企业形象和知名度，增加国际合作机会。

The enterprises can enjoy the opportunity to become members of WWF Enterprise League, stand side by side with world-famous enterprises, promote corporate images and popularity, and increase the chance of international cooperation.

（5）参加自愿协议的企业，可以通过示范项目（EMC服务和开展CDM交易）降低企业实施节能项目的运行成本，降低技术、投资等风险。

The enterprises that have concluded the voluntary agreement can reduce the cost of implementing the energy conservation project and reduce technical risk, investment risk and other risks though being pilot projects (EMC service and launching CDM trade).

（6）提高企业的能源管理意识和管理水平。

The enterprises can enhance their energy conservation sense and improve their management level.

（7）通过参加WWF自愿减排活动，提高企业的经济效益和社会效益，获得政府的支持和认可。

The enterprises can increase their economic benefits and social benefits and obtain the support and approval of the government through participating in the voluntary emission reduction activities of WWF.

5.参与WWF自愿减排活动企业需要履行的义务

The obligations of enterprise participated in the Enterprise's Emission Reduction Voluntary Activities of WWF

- 提高自身能源管理水平
- Improving their energy management level
- 承诺一定的节能目标
- Promising to make an energy-conservation goal and realize it
- 采取一定的节能措施
- Taking some energy conservation measures
- 定期提供能源消耗方面的信息
- Offering the information in respect of energy consumption regularly
- 接受独立机构的能源审计
- Accepting the energy auditing of an independent organization


谢 谢！
Thanks!

Annex 9.8.11

中国乡镇企业能效自愿协议的设计—初步成果
Development of Energy Efficiency Voluntary Agreements for TVEs in China

田宜水

农业部能源环保技术开发中心
CEEP

30th Mar. 2004

GEF项目试点企业
Pilot Enterprises of GEF Project

- 湖北省黄石市铁山区鹿峰水泥有限公司
- Lufeng Cement Co. Ltd. Tieshan District, Huangshi City, Hubei Province
- 四川省新津县永兴页岩砖有限公司
- Yongxing Shale Brick Co. Ltd. Xinjin County, Chengdu City,Sichuan Province
- 江苏省江宁县林陵铸造公司
- Moling Casting Company, Jiangning County, Jiangsu Province
- 辽宁省大连市金煤铸管有限公司
- Dalian Jinmei Cast Pipe Co.Ltd. Dalian City, Liaoning Province

前言
Background

2003年7月—2004年3月，农业部乡镇企业发展中心与农业能源环保技术开发中心作为分包商承担了全球环境基金/联合国工业发展组织项目"中国乡镇企业节能与温室气体减排 第二期"分包合同—"县级政策指导委员会及能力建设"。

From Jul. 2003 to Mar. 2004, TEDC & CEEP as the subcontractors took charge the establishment and capacity building of LPIC under the project entitled "Energy Conservation and Emissions Reduction in Chinese TVEs – Phase II " for UNIDO HQs.

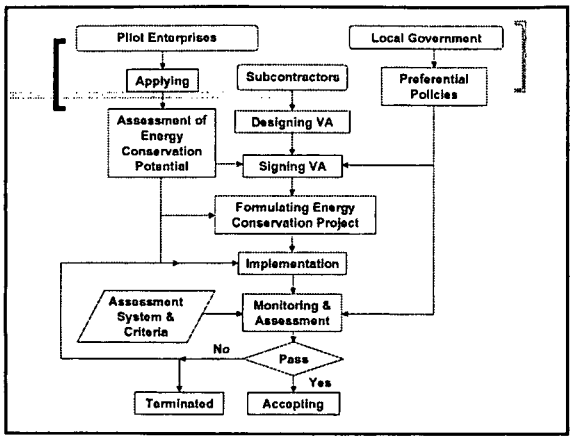
1. 试点项目实施概况
1. Implementation condition of demonstration project.
2. 乡镇企业能效自愿协议文本设计
2. To design energy efficiency volunteer agreement's text for TVEs in China.
3. 节能计划方案
3. Formulating energy conservation plan.
4. 建立监测评估体系
4. Establishment of monitoring and assessment system.
5. 经验与建议
5. Experiences and suggestion.

工作大纲
Terms of Reference

- 协助有关方（试点企业、地方政府和国家政策指导委员会）起草能效自愿协议，协助签订协议。
- To coordinate the preparation of energy efficiency voluntary agreements among relevant parties (pilot TVE, local authorities, and PIC), and facilitate the signing of the agreements.
- 制定监测和评估方案，对自愿协议进行监督。
- To develop a scheme to establish a monitoring and assessment system (including indicators) to monitor the implementation of the voluntary agreements.

1.试点项目实施情况
1. Implementation Status of Demonstration Projects

- 采用实地考察、座谈会以及问卷等形式与地方政府和试点企业进行交流，对试点企业进行能源审计，评估企业节能潜力，地方政府制定优惠政策，讨论节能技改方案，协商确定节能目标。
- To communicate with the local government and demonstration enterprises by field survey, seminar and questionnaires, implement energy audit to pilot enterprises, to assess energy conservation potential, to provide preferential policies by local government, to discuss energy conservation plan, to arrange and ensure energy conservation targets.
- 主要产出：
- Main outputs:
  - 四个试点企业的能效自愿协议
  - Energy efficiency VA of the four pilot enterprises
  - 乡镇企业能效自愿协议的监测评估体系
  - Monitoring and assessment system of TVEs



自愿协议—前言
VA—Background

- 能效自愿协议，是行业组织或企业在自愿的基础上，以提高能源效率和减排温室气体为目的，与政府签订的一种协议。行业组织或企业承诺在一定时间内要达到能效或减排目标，政府给予行业组织或企业优惠或激励。
- 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.
- 为了推动乡镇企业的监管制度改革及节能技术市场化，达到提高能源效率与减排温室气体的目的，特制定本自愿协议。
- 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.乡镇企业自愿协议文本设计（1）
2. To design energy efficiency VA's text for TVEs （1）

- 目标：设计符合中国乡镇企业实际情况的能效自愿协议。
- Targets: To design energy efficiency VA that adapt the actual circumstance of TVEs in China.
- 乡镇企业特点：
- Characteristic of TVEs:
  - 规模小、数量多、分布散、变化大、行业杂等；
  - Small-scale, numerous, dispersive, large-change, miscellaneous in industries etc.
  - 生产工艺简单、产品结构单一；
  - Simple production process, single product structure;
  - 资金不足、信息闭塞、技术条件差、生产设备落后。
  - Insufficiency funds, block in information, worse technical condition, behindhand production equipment.

自愿协议—节能目标
VA—Energy Conservation Targets

- 目标：节能技改目标：2005年12月31日完成，总体目标：2008年12月31日完成。
- To complete the energy conservation project & achieve the energy conservation targets by 31st Dec. 2005, to complete global targets by 31st Dec. 2008
- 指标：以2002年为基准，单位产品能耗(%)下降
- Based on 2002 (reference year), to reduce energy consumption per unit product (or production value)
  - 鹿峰水泥：21%，24%
  - Lufeng Cement：21%，24%
  - 永兴页岩砖：12%，15%
  - Yongxing Shale Brick：12%，15%
  - 林陵铸造：16%，20%
  - Moling Casting：16%，20%
  - 金煤铸管：20%，25%
  - Jinmei Cast Pipe：20%，25%

2. 乡镇企业自愿协议文本设计（2）
2. To design energy efficiency VA's text for TVEs（2）

- 框架性结构
- Framework structure
  - 前言
  - Background
  - 节能目标
  - Targets of energy conservation
  - 节能措施
  - Measures for energy conservation
  - 优惠政策
  - Preferential policies
  - 监测与评估
  - Monitoring and assessment
  - 修改与中止
  - Modifications and termination

间接节能
Indirect Energy Conservation

按整个产品的生命周期进行分析的节能新观念，包括鼓励生产节能型产品、延长产品使用寿命、优化产品处置或回收等。

The new concept for energy conservation by analyses through the overall product lifecycle, includes encouraging producing energy-conservation products, prolonging product life, optimizing product treatment and reclamation etc.

- 水泥行业：提高水泥质量，增加混合材量，节约原材料，减少混凝土水泥的参加量，延长产品寿命。
- Cement industry: Improving product quality, adding composite material quantity, saving saw material, reducing the proportion of cement in concrete, and prolonging product life.
- 制砖行业：节约原材料25%，冬季采暖或夏季空调降温能耗节省近25%。
- Brick industry: Saving saw material by 25% and decreasing energy consumption of buildings by 25% when products are utilized.

自愿协议—节能措施
VA—Measures for Energy Conservation

- 试点企业制定具体节能计划和节能技改方案，并提交当地政府评估审核后认真组织实施。
- 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.
- 试点企业加强企业内部的能源管理，完善企业能源管理体系，规范企业能效标准，完善企业内部的规章制度，提高企业员工的节能意识，任命专职能源管理员负责企业的能源管理工作。
- The demonstration enterprises 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.

自愿协议—修改和终止
VA—Modifications & Termination

协议执行期间出现下列情况，协议可以修改或终止：
The agreement shall be modified or terminated if the following conditions occur:

- 国家有关能源和环境的法律、法规和政策与协议签定年相比发生明显的变化；
- The laws, regulations, or policies related to energy or environmental protection have big changes compared with the year when the agreement is signed.
- 由于实施了本协议，对试点企业的业务经营与正常发展产生了不利的影响。
- Implementation of the agreement has negative impact to the development or normal operation of the demonstration enterprise.

自愿协议—监测与评估（1）
VA—Monitoring & Assessment（1）

- 帮助试点企业落实国家有关对部分新型墙体材料产品实行按增值税应税额减半征收的优惠政策；对试点企业使用国家鼓励发展的清洁生产目录中设备采取加速折旧；试点企业节能技改项目的能源审计和培训费用列入企业经营成本；试点企业研究、开发节能降耗技术所发生的费用提高比例限制，计入企业管理费用。
- The LPIC 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.

3.制定节能计划
3. Formulating Energy Conservation Plan

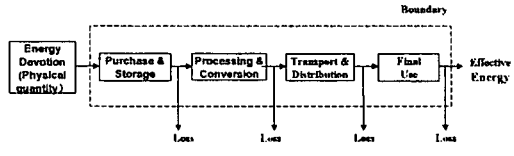
- 节能计划是一个系统有组织的、经济上可行的，以减少试点企业能源消耗量为目的技术措施，是自愿协议实施过程的行动指南，也作为评估年度监测报告的参考依据。
- Energy conservation plan is a technical measure that is systemic, organizational, feasible in economy, in order to reduce the energy consumption of demonstration enterprises. It is a action guide in the implementation progress of VA. It is also a reference frame to assess the annual monitoring report.

自愿协议—监测与评估（2）
VA—Monitoring & Assessment（2）

- 通过中小企业担保体系，争取中小企业担保资金协助试点企业克服融资难的障碍，通过国家政策指导委员会推荐试点企业申请滚动资金的委托贷款，用于节能技改项目。
- 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.
- 试点企业签署自愿协议后，对试点企业进行表彰，授予荣誉称号，在有关媒体上介绍宣传试点企业的经验，并总结推广能效自愿协议的经验。
- 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 suggestion from the technical team.

3.1准备阶段
3.1 Preparation Phase

- 在准备阶段，建议试点企业采用能源审计的方法，收集主要耗能工序和设备的数据，分析了企业目前的用能情况。
- During preparation phase, recommending demonstration enterprises adopting the energy audit method, to collect the main energy-consumption process steps and equipment data, and to analyze the current energy-consumption status.



3.2分析阶段
3.2 Analyse Measures

- 通过对试点企业的实际生产工艺能耗与国内外先进企业能耗进行对比，评估试点企业节能潜力，并考虑提高能效技术措施。
- By comparison between energy consumption of demonstration enterprise's actual production process and domestic and international advanced level, to assess energy conservation potential, and to consider improving energy efficiency measures.
- 节能措施：加强企业内部能源管理、节能技改项目、热电联产，建筑节能，余热、余压、放散可燃气体回收利用，可再生能源、资源回收与废弃物再利用等措施。
- Energy conservation measures: To enhance the measures such as energy management, energy conservation plan, cogeneration, building energy conservation, residual heat, excess pressure, reutilization of dispersing combustible gas, renewable energy resources, resource recovery, reutilization of wastes etc.

4.1各方的职责（1）
4.1 Obligations（1）

- 国家政策指导委员会：宏观指导，负责总体评价，奖励有成绩单位和个人，总结经验，传播和促进项目开展。
- PIC：Provide macroscopical guidance, assess the overall status of implementation, give encouragement or awards to organizations and individuals who make notable achievement, to sum up the experiences, disseminate the concept of VA and promote the development of VA projects nationwide
- 县级政策指导委员会：代表地方政府与试点企业签订协议，监督协议实施；提供支持政策。
- LPIC：Under the guidance and coordination of PIC, sign energy efficiency voluntary agreement with demonstration enterprises on behalf of the local government. Provide policy support for successful implementation of the voluntary agreement and keep the target of the voluntary agreement consistent with the national target.

3.3制定节能计划
3.3 Formulating Energy Conservation Plan

- 通过分析，试点企业可以确定提高能效的领域，获得一系列节能措施的建议，综合分析编写节能计划。
- By analyse, demonstration enterprises can ensure the field improving energy efficiency, gain a series of suggestion about energy conservation measures, then synthetically analyse and compile energy conservation plan.

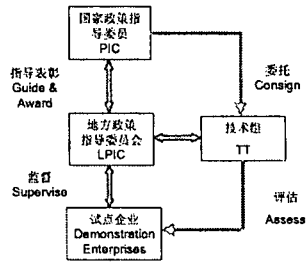
4.1各方的职责（2）
4.1 Obligations（2）

- 技术组：由PTPMC组建，VA专家、能效专家、行业专家、经济专家、法律专家等组成，负责对能效自愿协议进行咨询、监测与评估。
- Technical Team: PTPMC is responsible for establishing the TT, consisting of VA experts, energy efficiency experts, technical experts , economic experts, legal experts, and representatives from demonstration enterprises.
- 试点企业：制定具体节能计划和节能技改方案，并认真组织实施。
- Demonstration enterprises: To formulate detailed energy conservation plan and the energy conservation target and shall be seriously implemented by the demonstration enterprises.

4.建立监测评估体系
4. Establishment of Monitoring & Assessment System

- 目的：监测试点企业执行自愿协议的实际情况，评估它的实施效果。
- Purpose: To monitor the implementation of the VA in demonstration enterprises, and to assess the effect of the VA.
- 方式：根据协议，试点企业在协议实施期间，每年的第一季度以书面形式提交上一年度监测报告。
- Manner: According to the VA, the demonstration enterprise shall submit an annual supervision report in written form in the first quarter every year.

4.1各方的职责（3）
4.1 Obligations（3）



4.2监测内容
4.2 Content of Monitoring

- 企业生产数据（包括主要产品种类、产量和产值等）
- Production statistics (mainly on product types, production quantity, and production values)
- 企业能源消耗情况
- Status of energy consumption
- 节能计划执行情况
- Status of implementation of energy conservation plan
- 影响节能的因素
- Factors that influence the energy conservation activities
- 下一年节能计划和调整措施
- Energy conservation plan for the next year, and measures or projects that were or will be modified
- 信息反馈
- Feedback information

4.3评估体系（2）
4.3 Assessment System（2）

评价指标 Criteria	权重 Weight (X_i)	评价内容 Content
（3）能源管理 （3）Energy Management	0.20	企业能源管理规章制度，企业节能工作责任制及组织体系，企业能源计量管理，企业用能考核，奖励机制，节能培训。 Regulations on energy management, energy conservation responsibility system and organization system, quantitative management of energy conservation, examination of energy consumption, encouragement mechanism, training on energy conservation
（4）信息传播 （4）Information extension	0.10	信息交流，宣传自愿协议，对外影响。 Information exchange, extension of Voluntary Agreement

企业能源消耗情况
Status of Energy Consumption

种类 Type of Energy	能源消费实物量 Consumption Quantity	折标煤数 Standard Coal Coefficient	消费量 Consumption Quantity (tce)	CO_2排放量 CO_2 Emission (t)
煤炭 Coal (t)				
电力 Electricity (kWh)				
柴油 Diesel (t)				
汽油 Gasoline (t)				
焦炭 Coke (t)				
煤气 Coal Gas (t)				
天然气 Natural Gas (m^3)				
热力 Thermal Power (kcal)				
合计 Total				
产品产量 Production				
单位产品能耗 Unit product Energy Consumption				

4.4评估方法
4.4 Assessment Method

- 评分规则：技术组专家根据企业对评价指标的实际完成情况进行评分，评分采用5分制，优秀为5分，良好为4分，一般为3分，合格为2分，不合格为1分。
- Scoring Method (pi): Experts from the Technical Team give the score, Excellent: 5, Good: 4, Normal: 3, Pass: 2, Fail: 1
- 评分公式：
- Scoring Formula:

$$P = \sum_{i=1}^{4} p_i \times X_i$$

- 评估标准：
- Assessment Standard:
  - 当P≥4时，优秀； If P≥4, excellent;
  - 当4>P ≥2时，合格； If 4>P ≥2, pass;
  - P<2时，不合格。 If P<2, fail.

4.3评估体系（1）
4.3 Assessment System（1）

评价指标 Criteria	权重 Weight(X_i)	评价内容 Content
（1）节能效果 （1）Effect of Energy Conservation	0.35	节能量，节能率，单位产品（或产值）能耗，间接节能量，CO_2减排量，取得的经济效益。 Quantity of energy conservation, energy conservation ratio, energy consumption per unit (or value), indirect energy conservation quantity, quantity of CO_2 emission reduction, economic benefit.
（2）节能措施 （2）Application of Energy Conservation Measures	0.35	节能新技术与新工艺的使用、完成情况与效果，主要产品能耗指标与国内、外先进水平对比，建筑节能，余热、余压、余能可燃气体回收利用，热电联产，使用可再生能源，资源回收与废弃物再利用。 Application of new technologies and new technical process, implementation status and effect, comparison between energy consumption of major products and domestic and international advanced level, architecture energy saving, waste recycling, co-generation, use of renewable energy resources.

计算—能效指数
Calculation of Energy Efficiency

$$EEI = \frac{\sum_{i=1}^{n} P_i \cdot EI_i}{\sum_{i=1}^{n} P_i \cdot EI_{i,B}} \times 100$$

式中 Where:

EEI—能效指数 energy efficiency index

n—统计的产品种类数 number of products to be aggregated

EI_i—i类产品的实际单位产品能耗 actual energy intensity of process step for product i

$EI_{i,B}$—i类产品的单位产品能耗基准年值 base year or benchmark energy intensity of process step for product i

P_i—i类产品的产量 actual production quantity for product i.

计算—节能率
Calculation of Energy Conservation Rate

$$\gamma = \frac{EI_0 - EI}{EI_0} \qquad \xi = 1 - \sqrt[n]{\frac{EI}{EI_0}}$$

式中 where:

γ —节能率(%) Energy Conservation Rate (%)

ξ —年平均节能率(%) Annual Average Energy Conservation Rate (%)

EI—目标年的单位产品能耗 Energy Consumption per Unit Product in Target Year

EI_0—基年的单位产品能耗 Energy Consumption per Unit Product in Base Year

n—基年与目标年之间的间隔年数 Number of years between Target Year and Base Year

CO_2排放量计算
Calculation of CO_2 Emission

- 水泥生产过程中CO_2排放：
- CO_2 Emission in Cement Production:

$$Q = P \times EF / 1000$$

式中 where:

Q—水泥熟料CO_2的排放量(t) CO_2 Emission from clinker (t);

P—水泥熟料的产量(t) Production Quantity of Clinker (t);

EF—水泥熟料CO_2排放系数(t/t熟料) Clinker CO_2 Emission Factor (t/t clinker)

CO_2排放量计算
Calculation of CO_2 Emission

- CO_2排放量一般采用t—CO_2来表示，某种燃料排放量计算公式：
- CO_2 Emission from fuel I is calculated as below:

$$Q = P \times EC \times EF$$

式中 where：

Q—i种燃料CO_2的排放量(t) CO_2 Emission of i type fuel (t-CO_2);

P—在实际生产过程中，试点企业i种燃料的直接消耗量(t) Consumption Quantity of fuel i (t);

EC—i种能源的换算系数(GJ/t) Conversion factor of i type fuel (GJ/t), means the Energy Content of unit mass of fuel;

EF—i种能源的CO_2排放系数(t/GJ) CO_2 Emission factor of i type fuel (t/GJ), means the CO_2 Emission of unit mass of fuel.

计算—CO_2排放系数
Calculation of CO_2 Emission Factor

能源 Type of Energy	换算系数 Energy Content of Fuel (GJ/t)	C Emission Factor (t-C/TJ)	CO_2 Emission Factor (t-CO_2/TJ)
天然 Natural Gas	39.00	15.32	56.22
液化石油 LPG	47.31	17.32	63.12
汽油 Gasoline	44.80	18.90	69.36
煤油 Kerosene	44.75	19.60	71.93
柴油 Diesel	43.33	20.20	74.13
燃料油 Fuel Oil	40.19	21.10	77.43
无烟 Anthracite	24.49	26.35	96.70
炼焦煤 Coking Coal	20.73	24.26	89.03
褐煤 Brown Coal	13.19	24.08	88.37
焦炭 Coke	28.47	29.50	108.26

CO_2排放量计算
Calculation of CO_2 Emission

- 电力消耗CO_2排放：
- CO_2 emission of electricity consumption:

$$Q = P \times EC \times EF / 1000$$

式中 where:

Q—电力CO_2的排放量(t) CO_2 emission of electricity consumption (t);

P—用电总量(kWh) Electricity Consumption (kWh);

EC—供电煤耗(kgce/kWh) Standard Coal Consumption for Electricity Generation (kgce/kWh)

EF—标准煤的CO_2排放系数(t/t) CO_2 Emission factor of standard coal (t/t).

计算—电力工业供电标准煤耗
Calculation of Standard Coal Consumption for Electricity Generation

年份 Year	1999	2000	2001	2002
供电标准煤耗 Standard Coal Consumption for Electricity Generation /(kg/kWh)	399	392	385	383

计算—简便CO_2排放系数
Calculation of Energy Conservation-CO_2 Emission Factor

能源 Energy Saving (Material)	kWh	kgce	kg-C	kg-CO_2	g-NO_x	g-SO_2
1kWh	1	0.400	0.272	0.997	15	30
1kgce	2.5	1	0.680	2.493	32.5	75
1kg熟料 Clinker				0.509		

4.4技术经济评价
4.4Economic Assessment of Energy Conservation Technology

- 投资额
- Investment
- 净现值
- NPV
- 内部收益率
- IRR
- 投资回收期
- Investment Payback Period

5. 经验与建议
5. Experiences & Suggestion

- 积极开展对能效自愿协议的宣传活动
- To carry on some propagandas positively about energy efficiency VA.
- 有关政府部门应尽快制定激励政策
- The government departments concerned shall establish incentive policies as soon as possible.
- 发挥行业协会的作用
- To bring trade organization into play.

ECOFYS

Annex 9.8.12

自愿协议政策与项目的评估
Evaluation of Voluntary Agreement Policies and Programs

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2004年3月30日于北京

Beijing, 30 March 2004

Universiteit Utrecht

政策的效果与效率
Effectiveness and efficiency of policies

- 效果 Effectiveness:
  - 实施政策产生了哪些预期的影响/产出/结果/效应？ to what extent did a policy program contribute to the desired impact / outcome / results / effect?
- 效率或者成本效应 Efficiency or cost-effectiveness:
  - 项目的影响与项目成本的关系？是否可能更经济些？ what is the relation between the impact of the program and the costs? Could it be done cheaper?

目录Table of contents

- 政策评估的一些基本要素
  Some basics on policy evaluation
- 政策评估的案例
  Examples of policy evaluation
- 有关政策评估的建议
  Some recommendations on policy evaluation

成本包括哪些？What costs can be taken into account?

- 成本包括 Costs for:
  - 政府的 the government
  - 目标组（例如某些行业）the target group (e.g. industry)
  - 全体社会的 society as a whole
- 现金开支和其他成本（例如收入损失、外部成本、机遇成本，均可记入）Both out-of-pocket costs and other costs (e.g. lost income, external costs, opportunity costs, can be taken into account)

监测与评估的区别是什麽？
Monitoring and evaluation: what is the difference?

- 监测：对所发生的情况进行调查
  Monitoring: investigate what happens
  - 通常每年都进行 normally this is done every year
- 评估：调查所发生情况的原因和过程（以及与政策的关系）Evaluation: investigate why and how things happen (and to what extent this is the result of policies)
  - 是不定期进行的 this is done occasionally

能效项目评估中的问题
What are the problems in the evaluation of energy efficiency programs?

- 能效变化小
  Energy efficiency changes are small
- 没有政府的介入，能效仍有改进
  Energy efficiency improvements also occur without government intervention
- 其他政策具有相同的效果
  Other policies have an effect as well

政策是否有效?
Are policy instruments effective?
- 一些政策的评估
some policy evaluation -

1. 澳大利亚挑战温室气体项目
   Australian Greenhouse Challenge
2. 荷兰的长期节能自愿协议
   Long-term agreements on energy efficiency in the Netherlands
3. 荷兰投资补贴与财政激励
   Investment subsidies and fiscal incentives in the Netherlands

成果是怎样/在那儿取得的?
How where these results achieved?

- 参加项目的公司分别提供了预计的2000年度实施及不实施行动计划的排放量 Participating companies have provided estimates of what emissions would have been in 2000 with and without the actions defined in their action plans
- "实际上，在一个项目中确定某个行动是否实施是不太可能的" "In practice it has not been possible to quantify reliably which actions would have occurred in the absence of a program"
- 这意味着：挑战温室气体项目评估中过高地估计了所产生的效果 This means: evaluation of Greenhouse Challenge overestimates the effect of the program

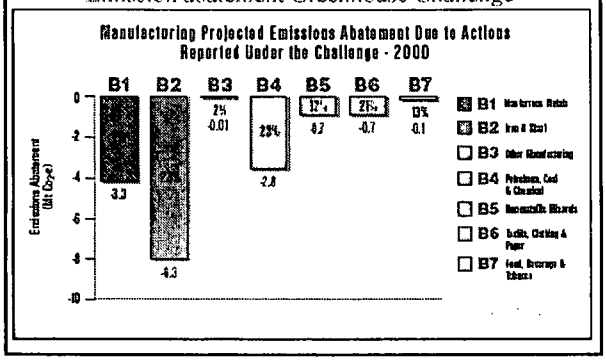
1.挑战温室气体项目（澳大利亚）
Greenhouse Challenge (Australia)

- 始于1995 Started in 1995
- 与企业单独签约 Agreements with individual firms
- 年度监测报告 Annual monitoring reports
- 1999年第一次评估 First evaluation in 1999
- 由澳大利亚温室办公室（负责该项目）进行评估Evaluation carried out by the Australian Greenhouse Office (responsible for the program)
- 政府/行业领导小组 Steering group government/industry

2. 荷兰的长期节能自愿协议
Long-term agreements
on energy-efficiency in the Netherlands

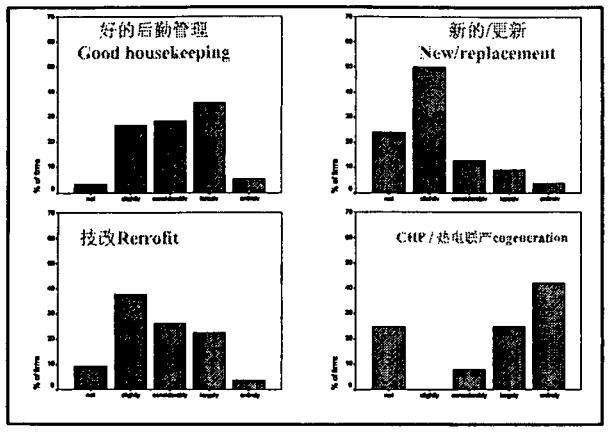
- 目标：从1989-2000，使单位产品能耗降低20% Target: reduction of energy use per unit of product by 20% van 1989 to 2000
- 共有30个行业一千多个公司参加，占全部工业能耗的75% 30 sectors involved, over 1000 companies, approx. 75% of industrial energy use
- 平均达到了预期目标，单有许多小行业为达标，另一些行业超额达标 On average targets are reached, but many (smaller) sectors failed; some over-achieved

温室气体减排
Emission abatement Greenhouse Challenge



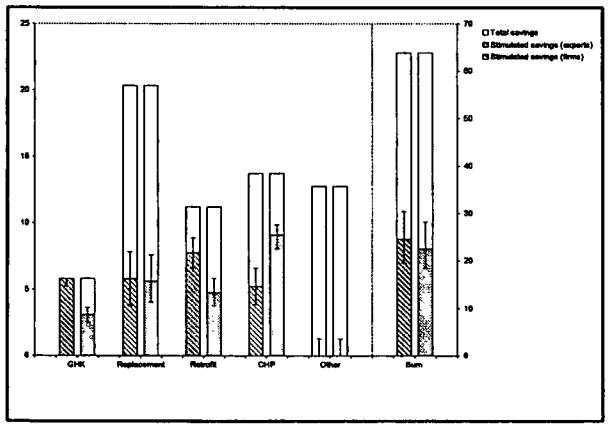
进行分析的二个方法
Two approaches in our analysis

- 由专家对准确分项的投入清单进行审核（一部分正式的评估是为经济事务部做的）Expert judgement on fairly well-defined categories of investment (part of formal evaluation for the Ministry of Economic Affairs)
- 审查了60家公司 Survey among 60 companies



长期协议是一揽子安排
A Long Term Agreement is a package deal:

- 协议Agreement (合同contract)
- 能源机构的支持 Support of energy agency
- 对可研给与补贴 Subsidies for feasibility studies
- 投资补贴 Investment subsidies
- 交流（信息服务）项目 Communication programmes



欧洲国家的谈判协议
Negotiated agreements in European countries

国别 Country	协议数 Number agree-ments	公司数 Number of firms	占总能耗 Coverage energy use
丹麦 Denmark	143	143	45%
法国 France	various	33	40%
德国 Germany	1	4400	70%
荷兰 Nethlands	30	1250	90%

自愿协议的成本 The costs of voluntary agreements
(政府方面 government perspective)

方式 Instrument	单位成本 Specific costs (欧元/吨 CO_2) (Euro/tonne of CO2) (5% discount rate, 10 years)
荷兰自愿协议 Dutch voluntary agreements	10 – 15 (热电联产 cogeneration 20)
投资法案 Investment Account Act (1980 - 1987)	~ 35 (宽范围 wide range)
EINP 补贴 EINP Subsidy	25 - 50
EIA 财政支持 EIA Fiscal support	~ 25 (5 - 400)

结论Results

- 我们估计荷兰25-50%的能效改进是通过实施自愿协议取得的 We estimate that 25 - 50% of the energy efficiency improvement in the Netherlands is caused by the Long Term Agreements
- 没有政府及有关政府机构的努力，这些成果是不太可能取得的 This effect would most likely not have been reached without the additional efforts made by the government and the government agencies

搭便车者Free Riders

(返馈率约为 response approx. 25%)

	方法 Method	搭便车的 Free-riders	被触发的 Triggered	"无理性的 Irrational"
EIA	阐明意向 stated behaviour	50%	50%	
	盈利分析 profitability analysis	65%	10%	25%
EINP	阐明意向 stated behaviour	50%	50%	
	盈利分析 profitability anlaysis	70%	15%	15%

3. 荷兰能源投入的支持项目

Investment Support Programmes in the Netherlands

EIA	对公司的财政支持 Fiscal support to companies	14,000	典型的支持：总投资的 15-20%
EINP	对非营利组织的补贴 Subsidies for non-profit organisations	1,200	Typical support: 15-20% of investment

补贴的成本效益 The Cost-Effectiveness of Subsidies

类型 Type	数目 Number	搭便车 Free-rider (%)	单位成本 Specific costs (Euro/tCO2)
Condenser 冷凝器	49	10 - 50	4 - 8
Frequency converter 变频器	46	40 - 65	15 - 30
Leight-weight trailer 轻型拖车	49	15 - 35	300 - 350
Wind turbine 风力涡轮机	16	0 - 15	~ 10
Insulation 绝/隔热	180	20 - 40	30 - 40
Energy blinds 能源阻断	67	25 - 65	10 - 20
Heat buffer system 热缓冲系统	47	20 - 60	10 - 25
CHP 热点联产	55	20 - 45	5 - 10
Generic 其它 (建筑 constr.)	25	40 - 50	5 - 6
Generic (equipm.)	21	30 - 60	3 - 25

二种策略 Two approaches

- 阐明意向："如没有补贴是否会进行投资？" Stated behaviour: "Would you have done the investment without the subsidy?"
- 盈利分析："补贴是否弥补了盈利不足的缺陷？" Profitability analysis: "Helps the subsidy overcome the lack of profitability?"

有关评估的建议 Recommendations on evaluation

- 在项目开始时制定评估计划 Plan evaluation at the start of the program
- 在政策的设计中包括建立评估工具（例如定期开展问卷调查）Build evaluation tools into the design of policy instruments (e.g. regular questionnaires)
- 应使评估具有连续性Bring continuity in the evaluation process (不断研究/改进learning)

推荐：理论基础上的评估

Recommended:
Theory-based evaluation

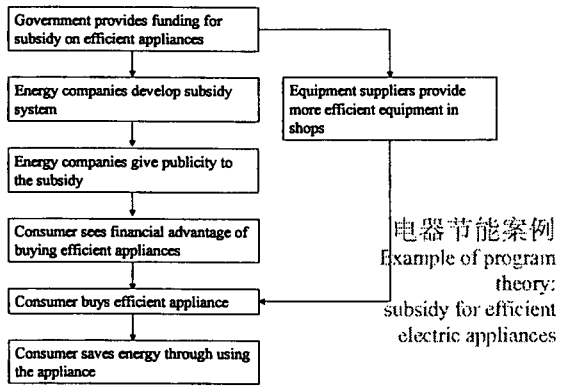
- 通过建立项目理论阐明项目预期的因果关系
  program theory sets out the expected cause-effect relations in a program
- 政策制定者希望怎样开展项目？ What did the policy-maker expect about how the program would work?
- 为因果关系链的每个阶段制定评估指标，以便进行评估 For each step in the cause-effect chain indicators are developed to measure what happens in that step
- 帮助对政策失败的原因进行分析 Helps to explain why policies failed.

结束语 Conclusions

节能项目的政策评估是不容易做的
Policy evaluation is not easy for energy efficiency programs

政策评估应确保：Policy evaluation is necessary to ensure:

- 有效的计划 （项目实施计划）effective programs (programs that work)
- 成本效益好的计划 （成本低的实施计划）cost-effective programs (programs that do not cost too much)
- 政府行为的信誉 credibility of government action



电器节能案例
Example of program theory: subsidy for efficient electric appliances

推荐的参考资料 Recommended reading

作者：Peter H. Rossi, Mark W. Lipsey, Howard E. Freeman:
评估- 一个系统性的策略 Evaluation – A Systematic Approach,
美国出版 Sage Publications, Thousand Oaks, CA, USA, 2004

Annex 9.8.13

Subcontract Report

Project manager Wang Hui

Under the guidance of the PMO, the project CTA and the PIC, MOA's Township Enterprise Development Center (TEDC) and MOA's Center for Energy & Environmental protection Center (CEEP) as the subcontractors have fulfilled the contract for the establishment and capacity building of LPICs in accordance with the project framework and objectives. During the contract period between July 1, 2003 and March 10th, 2004, LPICs have been established at the four pilot sites of Xinjin County, Sichuan Province, Tieshan District, Huangshi City, Hubei Province, Jiangning District, Nanjing City, Jiangsu Province and Dalian City. With our help, the statutes, action plans and voluntary agreements have been developed and formulated. The following is a brief report on the subcontract activities.

I. Working procedures and accomplishments

1. Working procedure

- Collection and analysis of information
- Training and surveys
- Drafting Statute, Action Plan, VA and Monitoring and Evaluation Scheme
- Finalizing the above documents after consultations with parties concerned
- Facilitating signing of VA by and between the local governments and the four pilot TVEs

2. Accomplishments

(1) Training

Against our work plan, the first training workshop was held in Beijing from Aug. 7th to Aug. 9th, 2003. Participants include officials from the LPICs at the four pilot sites under the subcontract, representatives of pilot TVEs, and those from the other four pilot sites of the UNDP/GEF project. At the workshop, the subcontractors explained to the participants on the working procedure, implementation plan, and the approach and methodology to develop the LPIC statute, VA framework and Action Plan. The participants had better understanding about the project background and objectives.

(2) Field surveys

Field surveys were carried out to the four pilot sites and TVEs on Sept. 20, 2003, Oct. 28, 2003 and February 16, 2004 respectively, of which four reports have been produced. The surveys included questionnaire, interviews, discussions and plant visits. Local officials, TVE executives and field experts were interviewed. The surveys identified barriers each pilot sites and TVEs encountered in applying energy efficient technology, and information about the local situation was gathered including industrial

development, industrial policies, ownership reform, energy consumption, enforcement of environmental protection regulations and laws, technical progress in energy efficiency, as well as market. Evaluation was done based on the information, and, findings and recommendations were given in the reports.

(3) Formulation of LPIC Statute

The subcontractors helped the four pilot sites in designing and developing LPIC Statute. The statute serves as the guiding principles for LPIC work. It defines the nature and purpose of LPIC, its organization structure, its membership, as well as its functions and working procedures.

(4) Development of Action Plan

The Action Plan was developed on the basis of survey findings. As one of the important tasks of the LPIC capacity building, Action Plan will serve to fulfill the objectives of the UNDP/GEF project. It gives the project background, identifies the main barriers for the pilot TVEs and industries to apply energy efficient technology, and sets the target for energy conservation and emissions reduction (short term objectives for 2003-2005, long-term for 2006-2008). Program is also developed to fulfill the targets.

(5) Design of VA

We assisted the local governments and TVEs in drafting energy efficiency VA and worked hard in facilitating the signing of the agreement. According to VA, the pilot TVEs is voluntarily committed to energy conservation or emissions reduction targets for a certain time frame while the local governments promises favorable policies or incentives for the TVEs when the targets are fulfilled. It is included in the VA the targets and measures to be taken by the TVEs, favorable policies for the TVEs fulfilling the targets, and monitoring and evaluation of VA implementation.

(6) Development of monitoring and evaluation scheme

A scheme is developed to monitor and evaluate the implementation of Action Plan and energy efficiency VA. The scheme gives detailed definition about the obligations of PIC, LPIC, Hongyuan Co (PTPMC) and pilot TVEs. It explains the monitoring procedure, the monitoring measures and evaluation system, as well as technical and economic evaluation of energy conservation in the pilot TVEs.

II. Observations

1. During the implementation of the subcontract, we have always been bearing in mind the project objectives, the TOR stipulations and the significance of the UNDP/GEF project. This is the principle for us to carry out all subcontract activities.
2. Preparations and surveys are important factors for us to accomplish contract activities. Each expert of the team used every means to collect information he needed. They approached government agencies, industrial associations, universities, or made use of libraries and internet, and learned

a lot about the laws and regulations relating to environmental protection and energy, related policies and their enforcement, the technical level and energy consumption in brick making, metal casting and cement industries as well as financial policies for small and medium sized enterprises. They improved themselves in VA knowledge—its definition, categories, application forms and its application both at home and abroad. Their self-study efforts paved a sound foundation to develop documents required for the capacity building of LPICs.

3. Support from the local governments and the pilot TVEs is also essential for us to smoothly complete the subcontract activities. The activities include field surveys at the four pilot sites. During the surveys, local TVE bureaus, local governments and TVEs offered us great assistance in making necessary arrangements. For instance, we started our work with Xinjin County. The county government gave special attention to our activities there, and the governor personally kept following the progress. Authorities concerned cooperated in arranging for discussions, field surveys and interviews, and providing us local policy documents. All these helped us in developing framework of the documents stipulated in the subcontract, serving as a model for the other pilot sites. Our work in Nanjing also attributes a lot to the local government and Moling Metal Casting Works. They were very cooperative in filling out questionnaire we sent to them before our field surveys started, giving us great convenience.
4. The documents—LPIC Statute, Action Plan, VA and Monitoring and Evaluation Scheme—should be developed in accordance with the local conditions so as to make them workable and practicable. The four pilot TVEs, making either bricks or cement or metal casting, involve different technology and raw materials. They differ from each other in energy consumption, energy efficient technology, and target for energy conservation should be set for each of them. The two metal casting TVEs are applying different production process, making different products and have different markets. Therefore, the VA design varies with the four pilots in terms of target setting and implementation methods. The designing of LPIC Statute also embodied the actual situation at the pilot sites. The establishment of LPICs is another example. Three of the four LPICs are at county or district level while the other (Dalian) is at municipal level; Dalian, Xinjin and Jiangning LPICs are established within local TVE bureau or SME bureau while Tieshan LPIC is founded within the district government. The four pilot sites have different environmental protection measures and favorable policies, and they face different barriers in technical upgrading. There is a big gap among them in ownership reform. All these differences were taken into consideration when we were designing the documents. They have the same framework, but differ in details.
5. Good teamwork plays an important part in accomplishing contract activities.

The LPIC Statute, Action Plan and VA are interrelated. Our experts in VA, training, law, energy efficiency and TVE consulted each other in the process of developing the three documents. National and international experts were also invited to help us. Six seminars were held among experts for discussions on and revision of the three documents.

6. Guidance and help from the project CTA, PIC and PMO is a guarantee for us to accomplish all contract activities. This contract is one part of an international project, and all activities under it must conform to international standard. We would like to thank CTA, PIC and PMO for their guidance and supervision in this regard. They helped us in understanding the tasks, joined us in field surveys giving us good advice about information collection. Our drafts were first handed to them for their comments and advice before submission to UNIDO. We have learned a lot from the CTA, Mr. Wang Xiwu and Mdm Wang Guiling.

III. Improvements to be made

1. More preparatory work is necessary before a survey is carried out.
2. More information is yet to be collected about the technologies applied in the pilot industries, and related policies.
3. More efforts should be taken to achieve better communication with the pilot sites and TVEs.

annex 9.8.14
UNDP/GEF "Energy Conservation and Greenhouse Gas Emissions Reduction in Chinese TVEs- Phase II"

The Establishment and Capacity Building of LPICs

Action Plan

--Designing approach, implementation and revision

Beijing
March 2004

1

Outline

1. Introduction of Action Plan
2. Designing approach
3. Design, implementation and revision

2

I. Introduction of Action Plan

1. **Definition**
2. **Objectives**
3. **Main points**

3

I. Introduction of Action Plan 1.1 Defination-1

Definitions

Action:

The state or process of acting or doing for a certain objective

Plan:

A scheme, program, or method worked out beforehand for the accomplishment of an objective

4

I. Introduction 1.1 Definition-2

Role of Action Plan in the project implementation:

Guiding principles, programming and activities developed by LPIC to remove policy barriers to promote energy efficient technology in TVEs.

5

I. Introduction of Action Plan 1.2 Objectives

Objectives:

To promote the removal of policy barriers to energy efficient technology in TVEs by various means, e.g. issuing governmental regulations and decrees in accordance with laws, acts and codes related, voluntary actions taken by TVEs, as well as other economical measures.

6

Introduction of Action Plan 1.3 Main points

- Investigate and identify policy barriers to energy efficient technology in TVEs restricting policy enforcement, technology update, financing and product marketing;
- Develop the sector's short term and mid - long term goals in energy efficiency and GHG emissions reduction.
- Develop measures to remove barriers identified

7

II. Designing approach

1.Guiding principles
2.Essential consideration
3.Working steps
4.Survey scope

8

II. Designing approach 2.1 Guiding principles

To steer and regulate the market through governmental policy developing and implementing thereby promoting the adoption of energy efficient technology shunting to market-oriented manner; To develop such a market-oriented mechanism that promotes TVEs to voluntarily adopt energy efficient and GHG emissions reduction technologies.

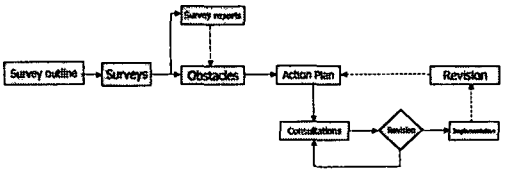
9

II. Designing approach 2.2 Basic considerations

- Emphasis of reduction in energy consumption and energy conservation
- Involvement of local governments as an encouraging force
- TVEs as the principal actor
- Market as a driving force
- 2 phases: phase 1: 2003-2005
  phase 2: 2005-2008

10

II. Designing approach 2.3 Working steps



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II. Designing approach 2.4 Survey scope

- Organization of TVEs and key issues related to their development
- TVE's ownership reform
- Current status of the sector
- Current effective policies and regulations related to energy efficiency and environmental protection, and their enforcement
- Deliberate framework of technical innovation for energy efficiency and VA

12

II. Designing approach 2.4 Survey scope

1.Status of industries
2.Status of pilot TVEs
3.Administrative system of industries and capacity building of LPICs
4.Status of ownership
5.Related industrial policies
6.Policies on environmental protection
7.Technologies applied in the pilot industries
8.Financial situation of the pilot industries
9. Market situation
10.Recommendations

13

III. Design, implementation and revision of Action Plan

1. Design basis
2.Outline of Action Plan
3.Case study
4. Action Plan features at the four pilot sites
5. Implementation & revision of Action Plan
6. More policy issues concerned

14

III. Design, implementation and revision of Action Plan 3.1 Design basis

- National rules, regulations and laws
- TOR
- Survey findings of policy barriers
- LPIC Statute
- Local plan for social and economic development
- Status quo of pilot TVEs

15

III. Design, implementation and revision of Action Plan 3.2 Outline of Action Plan

1. Project background
2. Barriers identified in the pilot industries
3. Objectives
   Short-term (2003-2005)
   Mid- and long-term (2006-2008)
4. Implementation procedures:
   (1). Energy efficiency VA signed by and between pilot TVEs and local governments
   (2). VA replication by LPIC
   (3). Capacity building
   (4). Study tour
   (5). Institutional arrangements
   (6). Preferential policies for VA participating TVEs
   (7). Enhanced publicity and replication of VA
   (8). Incentive mechanism

   .....

16

III. Design, implementation and revision of Action Plan 3.4 Action Plan features at the four pilot sites

Pilot sites	Features of four LPICs	Features of their Action Plan
Xinjin County	Good strength in coordinating among authorities concerned, and industrial administration	Incentive wall brick policy recommended; Special person appointed for energy efficiency; Energy efficiency network
Huangshi City	Good at overall coordination, the city is rich in resources, good tax policy	Taking full advantage of its resources; Effective enforcement of tax policy
Dalian City	Participation of city-level authorities & financial organizations; self-discipline of industries; port city, large export of products, historical industrial base	Good financial arrangement Self-discipline of industrial associations
Jiangning, Nanjing	LPIC is incorporated into "the municipal government supermarket"; good sales in domestic market; pilot TVE used to be a welfare factory	Visits to metal casting TVEs in Dalian TVE restructured A metal casting center base underway

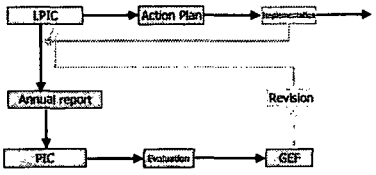
17

III. Design, implementation and revision of Action Plan 3.5 Case study

- **Xinjin, Dalian, Nanjing, Huangshi**
- **LPIC features**
- **Barriers identified**
- **Design of Action Plan**

18

III. Design, implementation and revision of Action Plan
3.6 Implementation and revision



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III. Design, implementation and revision of Action Plan
3.6 More policy issues concerned

- Some policies are being improved
  e.g. mechanism of pollution charge
- Policies need to be improved
  Environmental evaluation
  Tax policy for welfare TVEs

20

Thank you!

21

Annex 9.9

Recommendations on replication of Pilot Sites to Promote energy conservation and emissions reduction among TVEs

I. **To use the influence of the project to improve local officers' understanding of the project and their awareness of environmental protection**

- It is necessary to intensify in various ways, publicity of the project and its achievements so that it is known to more and more people
- More efforts should be made to integrate the project activities with training of officers at counties where the pilot industries are concentrated. Training activities should be designed to share with them information about environmental protection, national and international environment policies and the significance and outputs of the project. They should aim to improve the officers' awareness of environmental protection and their recognition of the project. Driven by the positive interaction between project intervention at pilot sites and local economic development, the local officers will be interested and voluntary in participating in the project.

II. **To draw on the activities undertaken at the pilot sites and develop favorable policies for replication**

- The characteristic policies and the experience of the project pilots will be useful for future pilot replication.
- If PIC takes the advantage of project implementation and coordinates ministries concerned for more national policies in favor of pilot sites, local governments will be enthusiastic to participate in pilot replication.

III. **Principles for selecting replication pilots**

- The pilot industries and TVEs there are concentrated (or commercialized), and

there are quite a number of excellent TVEs.

- The sites show good performance in environmental protection.
- TVE ownership reform is almost accomplished.
- There is a sound system of SME (TVE) administration.
- Local governments have strong interest in participating and clear objectives.
- Ongoing national and international environment projects can be considered for integration with the pilot replication to mutual benefit.

IV. Project activities and pilot replication

Project activities should be designed to take place at candidate sites for pilot replication so that project activities and pilot replication be integrated.

V. Recommendations on pilot replication

- LPICs can be established in various forms. The arrangement and functions of local governments differ from each other. The actual capacity and the attitude of local TVE authority or its supporting agency should be taken into consideration in fixing the form and functions of LPIC. LPICs can take different forms and have their own characteristics provided that priority is given to energy conservation and emissions reduction.
- Action plans should incorporate the current and long-term work plan and strategy of local governments so that they compliment each other and interact in a good manner.
- Priority should be given to TVEs that enjoy good capital flow, clear ownership and promising market and those that will produce influence as a pilot in energy conservation and emissions reduction.

Annex 9.10.1

新津县人民政府办公室文件

新津府办发[2002]15号

新津县人民政府办公室
关于成立新津县乡镇企业节能和温室气体减排二期项目地方政策指导委员会的
通　　知

各镇乡人民政府、县府有关部门：

为推动我县乡镇企业管理制度改革，提高能源使用效率，降低温室气体排放，经县政府研究，决定成立新津县乡镇企业节能和温室气体减排二期项目地方政策指导委员会，现将委员会成员名单通知如下：

主　任：赵　刚　县政府副县长

副主任：张　俊　县政府办副主任、县信息办副主任

王利志　县中小企业局局长

鲜文玉　县环保局局长

委　员：史忠伟　县国土资源局副局长

张永忠　县建设和规划局副局长

江玉师　县环保局副局长

童家治　县中小企业局纪检员

委员会下设办公室，办公室设在县中小企业局，办公室主任由王利志同志兼任。

新津县人民政府办公室

二〇〇二年三月二十五日

主题词：非常设机构　成立　通知

抄送：县委办公室，县人大办公室，县政协办公室。

新津县人民政府办公室　　2002年3月25日印

（共印30份）

Annex 9.10.2

大连市乡镇企业局文件

大乡企发[2003] 31 号

关于成立大连市乡镇企业节能与环保工作协调小组的通知

各区市县（先导区）乡镇企业局（经发局）:

为更好发挥乡镇企业在老工业基地振兴和“大大连”建设中的作用，推动节能与环保工作有效进行，按照全球环境基金中国乡镇企业节能与温室气体减排项目建设大连示范区的要求，成立大连市乡镇企业节能与环保工作协调小组:

组　长: 杨吉奎　大连市乡镇企业局局长

副组长: 袁　辉　大连市乡镇企业局副局长

成　员: 刘树东　大连市科技局农村与社会发展处处长

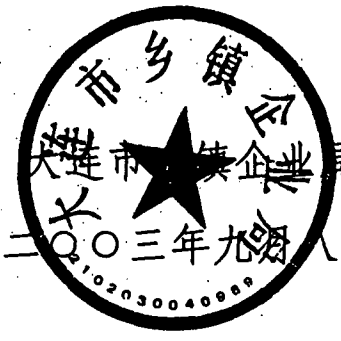
鲁若愚　大连市环保局污染控制处处长

孙国友　大连市金融办综合处副处长

尹新杰　大连市乡镇企业局产业处副处长

丁建东　大连市乡镇企业局办公室副主任

协调小组办公室设在大连市乡镇企业局，袁辉任办公室主任，联系电话：0411—4343122。



大连市乡镇企业局

二〇〇三年九月八日

主题词：农业　乡镇企业 科技　通知

抄送：农业部乡镇企业局、农业部科技教育司、农业部 GEF 项目办公室，市环保局、市科技局、市金融办。

（共印 27 份）

大连市乡镇企业局办公室　　2003 年 9 月 8 日印发

Annex 9.10.3

黄石市铁山区人民政府办公室文件

铁政办发[2003]38号

区政府办公室
关于调整黄石市铁山区乡镇企业节能和温室气体减排二期项目地方政策指导委员会的通知

各街道办事处、各企事业单位、区政府各部门：

由于人事变动，区政府经研究，决定调整黄石市铁山区乡镇企业节能和温室气体减排二期项目地方政策指导委员会，现将调整人员名单通知如下：

主　任：刘公海　区政府常务副区长

副主任：左名幸　区政府副区长

张　辉　区政府副区长

胡国香　区政府区长助理、区政府办公室主任

委　员：赵细中　区计划统计物价局局长

黄朝鸣　区经济发展局局长

何仲端　区科技局局长

洪亨龙　区环保局局长

谈国华　区财政局局长

夏跃武　区农林水利局局长、区工农关系办公室主任

胡鸿卫　鹿獐山街道办事处主任

邹　胜　农业银行铁山办事处主任

汪惠洋　区政府办公室副主任

委员会下设办公室，办公室设在区政府办公室，办公室主任由汪惠洋兼任，负责日常工作。

铁山区人民政府办公室

二〇〇三年九月八日

主题词：非常设机构　成立　通知

抄　送：区委办公室、区人大常委会办公室、区政协办公室、区人武部

铁山区人民政府办公室　　2003年9月10日印发

共印40份

Annex 9.10.4

南京市江宁区人民政府文件

江宁政发(2002)262号

关于成立江宁区乡镇企业节能与温室气体减排项目政策指导委员会的通知

各镇人民政府（街道办）、区府各部门、区各直属单位:

全国乡镇企业节能与温室气体减排项目是由全球环境基金（GEF）资助，旨在帮助我国乡镇企业通过高效节能技术的采用，减少制砖、水泥、铸造以及炼焦产业在中国的温室气体排放。我区是该项目的第二期试点地区，为在我区创造实施该项目的良好政策环境，加强全区环保节能法规的执行力度，促进我区乡镇企业采用高效节能技术，减少温室气体排放，增强地区可持续发展能力，根据该项目国家级政策指导委员会（PIC）的相关要求，经区政府研究决定，成立江宁区乡镇企业节能与温室气体减排项目政策指导委员会，成员名单如下:

主　任: 成玉祥　　区委常委、区政府副区长

副主任：严应骏　　区政府办副主任

贾安鑫　　区乡企局局长

成　员：丁圣荣　　区财政局局长

郭　星　　区科技局局长

刘为成　　区环保局局长

王　玲　　区计经局副局长

曹　明　　区农行行长

徐文成　　秣陵镇副镇长

梁鑫保　　秣陵铸造厂厂长

指导委员会下设办公室，办公地点设在区乡镇企业管理局，由严应骏同志兼任办公室主任。

南京市江宁区人民政府

二00二年八月二十三日

主题词：企业　环保　机构　通知

抄送：区委各部门、人大办、政协办、法院、检察院