UNITED NATIONS DEVELOPMENT PROGRAMME CHINA

ENERGY CONSERVATION AND GREEN HOUSE GAS EMISSIONS REDUCTION IN TOWNSHIP AND VILLAGE ENTERPRISES (TVE) IN CHINA

CPR/95/G31

REPORT OF THE EVALUATION MISSION

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JULY 1999

LIST OF ABBREVIATIONS

AEPI	Agro-Environmental Protection Institute
ERI	The Energy Research Institute
GEF	Global Environmental Facility
GHG	Green House Gas Emissions
MOA	Ministry of Agriculture
MOF	Ministry of Finance
MOST	Ministry of Science & Technology
NCG	National Co-ordination Group
NPD	National Project Director
PMO	Project Management Office
SEPA	State Environmental Protection Administration
SETC	State Economic and Trade Commission
SOE	State Owned Enterprises
TVE	Township and Village Enterprises
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization

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INTRODUCTION

The Evaluation Mission of the project as per the Terms of Reference (Annexure I) conducted the task from 15 July – 30 July 1999 as per schedule (Annexure II).

The Evaluation included meetings (list of persons-Annexure III) with UNDP, UNIDO, ERI, AEPI, TVE to assess the objectives, scope, activities undertaken and the outputs derived. Further the documents reviewed (Annexure IV) were provided by UNIDO, MOA, ERI and AEPI.

The ensuing report is the culmination of the analysis and findings as per the UNDP "Guidelines for Evaluators"

ACKNOWLEGEMENT

Personally I take this opportunity to thank UNDP/UNIDO in expressing their confidence in my ability to undertake the Evaluation Mission. The mission was accomplished with active co-operation and assistance from UNDP, UNIDO, MOA, ERI, AEPI, TVEs and host of others. I wish to thank all the individuals and organizations for facilitating my task.

I would like to thank my parent organization CII for sparing my time to undertake this mission.

I. EXECUTIVE SUMMARY

Township and village enterprises (TVE) in China form the backbone of the rural economy contributing to over 50 percent of the industrial value added comprising 2.2 million units, employing 129 million people (as of 1995). TVE have engaged surplus agricultural labor, raised standard of living of farmers, induced social stability and prevented urban migration. By their nature, TVE have employed widely diverse scale and genre of technologies, financing mechanisms and capability. Generally, they exhibit lower performance levels than state owned Enterprises (SOE). However the TVE have higher growth rates than other sectors. In view of their strategic importance China is embarking on a twin-track development of SOE and TVE sectors in parallel streams.

As a signatory the United Nations Framework Convention on Climate change (UNFCCC) China is committed to sustainable Development-growth with minimal environmental impact especially relating to Green House Gas (GHG) emissions. As TVE account for one-third of the energy consumed in China and contribute significantly to GHG emissions, Chinese Government is keen to enhance the capability and capacity of TVE to undertake Energy Efficiency and Pollution Control programs. Among TVE, four sub-sectors namely brick making, cement, coking and metal casting were energy intensive consuming 47.2 percent of the energy consumed by TVE and contributing to 57.5 percent of the GHG emissions.

Accordingly this project was undertaken by Ministry of Agriculture (MOA) on behalf of Government of China (GOC) with the assistance of Global Environment facility (GEF) through United Nations Development Programme (UNDP) and implemented by United Nations Industrial Development Organization (UNIDO) to focus on the four sub-sectors to

- identify areas of energy improvement
- identify barriers to their implementation
- identify institutions which can provide service and training to TVE on Energy Auditing and Management and strategy to upgrade their knowledge, skills and facilities.
- identify pilot project sites where barrier removal strategies could be tried out and implemented.

MOA being the administrative ministry in control of TVE was the institution involved in the execution of the project.

The project was designed with the objective of

a) Preparing GEF proposals for addressing barriers in commercializing energy efficiency and GHG reduction technologies.
b) Developing capacities in implementing energy efficiency projects.

The project was managed by the Project Management Office (PMO) with co-ordination with National Co-ordination Group (NCG) involving State Environment Protection Administration (SEPA), MOA, State Economic and Trade Commission (SETC), Ministry of Finance (MOF), Ministry of Science and Technology (MOST), UNIDO, international experts and National experts to advise on strategy, information promotion and introduction of energy efficiency measures.

The project immediate objectives have been realized with the outputs as outlined:

a) Preparation of a comprehensive inventory of energy efficient technologies available in China; identifying gaps for further technology development
b) Selection of sites to demonstrate key marketable energy efficient technologies applicable to four sub-sectors
c) Preparation of a report on the best international practices for the introduction and commercialization of industrial energy efficient technologies
d) Assessment of TVE service and Training institutions for implementing demonstration and commercialization of energy efficient technologies.
e) Formulation of Project Brief for the Phase II of the project for implementing the innovated approaches for commercialization of GHG reduction technologies.
f) Developing a training package in Energy Auditing and Management
g) Evolving Master Trainers with familiarity of TVE uniqueness and with Energy Auditing and Management abilities.
h) Preparation of a financially sustainable training plan to enhance TVE capability to undertake Energy Efficiency Programmes.

Fellowship programme to United States and Study Tour to United Kingdom were added components of the project. The tasks were implemented through two sub-contracts awarded after due process of selection to the Energy Research Institute (ERI) and Agro-Environment Protection Institute (AEPI).

The activities were carried out by the two sub-contractors along with international experts and national experts to the satisfaction of all concerned. The physical targets have been met and the activities envisaged performed. The MOA, UNIDO and the sub-contracts have realized the outputs in line with the Project Document with minor variations.

With the implementation of the project, the policy makers have better appreciation of the policy barriers; TVE bureaus and TVE of the market, technology and financing barriers; Best Practices for introducing Energy

Efficiency Technologies in the four sub-sectors developed; training and service institutions identified for upgraduation of knowledge, skills and facilities to conduct training programmes on Energy Auditing and management; Master trainers developed with the understanding of energy Auditing and management at the enterprise level; pilot project sites identified for implementing energy efficiency projects for Phase II of the project.

The project brief for Phase II has set the objective of increasing the utilization of energy efficient technologies in the four sub-sectors. The project is expected to remove key market, regulatory, technology, management and commercial barriers to the production, market and utilization of energy efficient technologies and products in these industries.

The evaluation of the project indicated technology bias of the approach adapted with some emphasis on policy, market and lesser focus on financing.

- Non-commercial financial institutions concerned with TVEs could have been involved in evolving the training packages and their nominees trained as Master Trainers;
- There could have been better communication between Sub-Contracts especially in the software development and use;
- Benefits from the project are likely to accrue to large and medium enterprises, and for small enterprises different approach may be needed;
- 30 percent involvement of women in capacity building was not noticed.

The project has been an outstanding success, keeping in view the complexity of the TVE sector, the diverse institutions and the number of activities organized and co-ordinated. The project has achieved the physical targets with minimum deviations from the original project document with marginal time overrun and costs within the stipulated budgets with minor modifications. The MOA and UNIDO could possibly note the findings and may like to bring about more cohesion among the different barrier removal institutions; particular emphasis could be to draw the financial institutions more actively in the exercise. There are international projects on energy conservation by SOE; Interchange of experience of these projects could enhance the value of Phase II.

II. PROJECT CONCEPT AND DESIGN

A. Context of the Project

The project was conceived to enhance the capabilities of TVE to implement Energy Efficiency Programmes and reduce GHG emissions. Four Sub-sectors namely Brick making, cement, coking and metal casting constituting 42.7 percent of the TVE energy consumption and 57.5 percent (as of 1995) of the GHG emissions were targeted to evolve strategies for developing energy conservation and pollution control measures as model forerunners for adoption by TVE sector as a whole.

B. Project Document

1. The problem and the technical approach

TVE is the grass-root sector involving 22 million enterprises, employing 129 million people. It is the backbone of the rural economy critical to poverty alleviation by transferring surplus agricultural labour, raising the farmers' living standards and maintenance of social stability. TVE is instrumental in preventing urban migration and is actively encouraged. TVE have shown very high growth rates compared to other sectors and Government of China attaches great importance to the development of the sector. It is well recognized that the TVE industries in the comparable sub-sectors consume 25-30 percent more energy than their counterparts in the SOE, the latter themselves being far away from the international norms. In view of their strategic contribution, China is keen to upgrade the skills, technology and performance of TVE to improve their competitiveness. As energy efficiency provides the opportunity for reducing costs and at the same time reduces GHG emissions, this project assumes significance.

As a signatory to the UNFCCC, Chinese Government is keen on GHG emission reduction programmes. Keeping in view the sustainable objectives of GEF, this project is regarded highly in identifying and evolving strategies to overcome barriers to implement energy efficiency projects. Thus this project is aligned to the Chinese strategy of economic development with environmental compatibility. As the energy conservation law and pollution control laws have been observed more in breach than in practice by TVE, the current project by addressing the issues of energy efficiency and pollution control strategies will help TVE realize the benefits and conform to the regulations.

2. Objectives, indicators and major assumptions

The objectives of the project are to

a) Address barriers in TVE in commercializing energy efficiency and GHG reduction technologies.

b) Develop capacities to implement selected pilot projects to achieve the desired goals.

The project fits well into the UNDP areas of interest namely poverty alleviation and grass roots participation in development, addressing environmental problems by pollution control through natural resources management namely energy efficiency and transfer of technology from more advanced industries within China itself. The experience gained could be a good model for other developing countries. However the question mark would be on gender bias. While overall reduction in poverty will indirectly bring women into the growth process, the direct involvement of 30 percent women in capacity building seems to be too ambitions.

3. Beneficiaries

The intended beneficiaries of the project were identified as

a) TVE managers, Government authorities and institutions responsible for the development and environmental protection of this sector and organizations interested in sustainable industrial development and economic growth.
b) Selected TVE for which a greater awareness of environmental consideration and implications for proper environmental management including education in GHG emissions and treatment techniques would encourage the adoption of measures combining the efficient use of resources with GHG abatement; thus resulting in economic and environmental benefits. These enterprises will further improve their public image as well as the quality and quantity of their products.

4. Modalities of Execution

MOA is the Government agency responsible the administration of the TVE sector including energy and environmental activities in terms of planning, R & D, technical support system and funding. The MOA has a network consisting of TVE Bureaus at provincial, municipal, county and township level which are responsible for local TVE economy, energy management and environmental protection. Some 60 institutions are involved in providing technical support in terms of quality control, management and marketing. Hence MOA was the logical institution selected to implement the project with the assistance of GEF under the aegis of UNDP with the execution effected by UNIDO.

The work plan was accordingly developed with work allocation allotted to assigned agencies agreed upon by the MOA, GEF, UNDP and UNIDO. The project framework involved

a) in-depth surveys of TVE to improve the understanding of the current technology inventory, product qualities, financial status, market conditions, investment plans and barriers to technology improvement especially energy efficiency improvements
b) on-site visits, a portfolio of possible energy conservation measures and investment as well as assessment of the measures to mitigate the barriers to their implementation with the help of international and national experts.
c) Identifying 8 pilot projects after conducting pre feasibility studies for implementing energy efficiency measures.
d) Developing training package with a mechanism for delivery to key stake holders of TVE
e) Assessment of existing TVE training and service institutions for implementing energy efficiency projects
f) A National co-ordination group to help co-ordinate and oversee project implementation
g) Fellowship and Study Tours of Chinese policy makers, TVE stake holders

III PROJECT IMPLEMENTATION

MOA was entrusted with the overall responsibility for the implementation of the project and achievement of its objectives.

A National Project Director (NPD) was appointed by MOA to manage the project according to the work plan and objectives of the project. NPD is the link between GOC and UNIDO and is responsible for the review, monitoring, clearance of work plans and the basis of project execution.

A. Activities

The activities were distinct in two parts namely

i. Project preparation for the demonstration and commercialization of energy efficiency technologies in brick making, cement, coking and metal casting sub-sectors in China.
ii. Capacity Development in the execution of industrial energy efficiency procedures and technology diffusion to provide a foundation for the implementation of pilot projects.

MOA and UNIDO were in agreement with the issues involved on project implementation. Accordingly the activities were sub-contracted to two agencies by MOA on the basis of competition and selection. ERI and AEPI were selected to conduct i and ii activities respectively.

ERI sub-contract included

i. A comprehensive inventory of appropriate energy efficiency technologies available in China; technology gaps identified for further technology development.
ii. 8 plant sites selected to demonstrate key marketable energy efficient technologies applicable to the four intended TVE sub-sectors.
iii. A report on best international practices for the introduction and commercialization of industrial energy efficient technologies in order to build on market forces to ensure the widespread dissemination of technologies demonstrated. The strategy was to examine the weak regulatory and economic incentives, lack of access to financial resources and lack of effective information dissemination.
iv. Assessment of 14 TVE service and training institutions and strengthening measures for enabling the institutions to play a key role in the demonstration and commercialization of energy efficient technologies.
v. Formulation of the Phase II of the Project Document (to be prepared by August 1999).

AEPI sub-contract involved

i. Development of Training Package in Energy Auditing and Management in TVE.
ii. Evolving 50 Master Trainers with familiarity of TVE uniqueness and with energy auditing and management technology abilities.
iii. Preparation of financially sustainable training plan to enable TVE to undertake Energy Efficiency programmes.

The sub-contractors have delivered their committed outputs. Considering the ambitious nature of the project, tight time frames the sub-contractors have fared admirably in comprehending the issues and fulfilled the contract obligations. The contribution of MOA and the NPD in facilitating the work of the sub contractors is worth appreciation.

However of the barriers identified namely policy, technology market and finance the project is heavily biased towards technology with adequate emphasis on policy and market. The strategy has been weak on financing issues. The financing of TVE is a complex one as though 50 percent of China's industrial output is from the TVE the commercial finance available to them is scanty. The TVE is financed by farmers, farmers' foundation, co-operatives, Agricultural Banks, local Banks, stock markets and only marginally by commercial banks. It would have been beneficial to have financial institutions adequately represented in the activities. For example the Report on the "Financing institutions and

Financing mechanisms" could have included these institutions apart from commercial banks with sub-contract I. Similarly of the Master Trainers developed, financing institutions could have had their nominations trained in sub-contract II. This would have enabled financial institutions to understand the issues, risks and evolve instruments to finance energy efficiency and pollution control measures.

Otherwise the strategies evolved are in line with the development approaches of China and is line with the intention of the GOC to bring about policy changes in transiting to the market economy.

The National Staff involved in the project showed high level of commitment and exhibited great enthusiasm in continuing the project to the Phase II stage. The project, while being implemented, witnessed re-organization of the MOA. This had an effect on delaying nominations for the fellowships. Otherwise the sub-contracts contributed to the success of the project. The MOA constituting the NCG has been able to co-ordinate with the sub-contractors and the UNIDO has enabled the project to be administered well and managed within the budget.

The international experts were held in high esteem by the MOA. The outputs of the international experts and their incisive interventions with the sub-contractors are said to be beneficial and strategic in compiling the energy efficient technologies, training packages, marketing and financing issues. The fellowship and the study tour to US and UK helped the national staff to provide inputs to sub-contract II in developing the training package.

The equipment provided under the project included basic set of instruments for Energy Auditing and computers to MOA. The equipment seem to have been procured and utilized according to the project plan.

B. Quality of Monitoring and Backstopping

An internal meeting of 30 September 1998 had critically reviewed the project. It commented on the ambitious nature of the project and to convince the concerned that the activities are doable. It also commented on the deviations from the original plan, incremental cost analysis. Clarity was also sought on the distinction between activities and outputs. The Chief Technical Advisor (CTA) was addressed to justify the deviations and submit the Project Brief by 8 October 1998.

The internal monitoring on tracking the outputs from the contractors and fellowship/study tour in co-ordination with MOA has been satisfactory. The project was stand-alone and did not have the complementary support of other UN agencies or UNDP.

IV. PROJECT RESULTS

A. Relevance

MOA is the controlling ministry of the TVE. As TVE contribute over 50 percent of the industrial value added and their growth rates are higher than other sectors, MOA as the recipient institution is relevant. The approach involving the TVE in the sub-sector to draw up the barriers that impede the implementation of energy efficiency and pollution control measures and identifying 8 pilot projects for implementation was logical. The projected Phase II, a continuation of this project is made possible by the MOA with the approach adopted for the study and outputs derived from the planned activities.

B. Efficiency

The project was well managed with the National Co-ordination Group led by the NPD. The well represented NCG ensured the smooth implementation of the project. The matching contribution by MOA in providing personnel, training, timely procurement and deployment of equipment such as computers and Energy Audit instruments have been arranged with minor delays and alterations.

C. Outputs

- NCG with representation of SEPA, MOA, MOF, MOST, SETC, UNIDO, international and national experts established to advice on strategy and information promotion and introduction of energy efficiency measures.
- A portfolio of energy efficient technologies and best practices prepared.
- Assessment measures to mitigate barriers to energy efficiency made.
- 8 host TVE sites selected for Technology Demonstration after pre-feasibility studies.
- A training package prepared with didactic material, videotape and software.
    - A pilot training programme undertaken to test check the package
    - 30 persons trained as Master Trainers for conducting programmes at local level
- Fellowship/study tour to US/UK have prepared Resource persons for implementing pilot projects

D Immediate Objectives

Immediate objective I

It was envisaged that a comprehensive GEF project would be prepared for the demonstration and commercialization of energy efficient technologies in four key sub-sections of brick making, cement, coking and metal casting in China.

The success of the objective can be seen from

Activity		Objective	Achievement
i)	Survey of potential TVE sites for Energy Efficiency Demonstration	50	76
ii)	Selection of optimum Demonstration Sites	4-8	8
iii)	Survey of		
	1) Local Rural Energy and TVE Technical Service and Training Institutions	20	80
	2) Rural TVE Energy Technical Training and Service Centers	10	
iv)	Assessment of Existing Capacity to Provide Energy Efficiency Support Services		14
v)	Preparation of Project Brief for Phase II		Prepared and approved

Immediate Objective – II

It was intended to develop capacity in the execution of industrial energy efficiency procedures and technology diffusion to provide a foundation for optimum implementation of Phase II.

The success of this objective can be assessed from

i. Preparation of the Report summarizing the best international practices for the introduction and promotion of energy efficient technologies applicable to TVE
ii. Development of a Training Package for Energy Auditing and Management including didactic material, videotape and software package
iii. 30 Master Trainers developed in energy Auditing and Management

The outputs as envisaged by the immediate objectives have set the stage for facilitating implementation of enterprise level projects with the policy makers made familiar with policy barriers, TVE bureaus and TVE of the marketing, technology and finance barriers and the Master Trainers the understanding of organizing Energy Audits and Management at the enterprise level. Barring the fact that the financial institutions concerned with TVE could have participated in the Training Programmes and could have also had personnel developed as Master Trainers, the project is likely to create impact

among the more progressive large and medium TVE. The small TVE are not considered to have the infrastructure skills and organizational capability to undertake the energy efficiency and pollution control measures. A different strategy may be required to develop their capabilities.

E. Development Objectives

The pilot projects which are likely to be implemented in the Phase II will act as forerunners in developing policy initiatives, technology benchmarks, market mechanism and financial instruments to implement energy efficiency measures thereby reducing GHG emissions especially in the large and medium industries.

As TVEs are likely to expand their capacities with growth rates higher than other sectors, MOA through TVE administration may take a policy decision to only allow those TVE which fulfill the criteria of bench marks of Energy consumption, minimum capacity and technology choice for future expansion.

The older units which are unable to implement energy efficiency measures and which do not conform to the performance criteria could be phased out. This would lead to a healthy TVE sector growth with environment compliance.

F. Effectiveness

The project has been effective in sensitizing the principal agencies and institutions on the need for organizing energy efficiency implementation efforts and realizing the need to develop capacity for pilot demonstration projects.

The effectiveness could have been improved with the involvement of financial institutions in the Master Trainer development, use of software package on Energy Audit and the pre-feasibility software comfar III.

The sub-contract I used comfar III package for selecting the pilot projects for conducting pre-feasibility analysis, sub-contract II evolved a software package for Energy Auditing and Management. The two packages have been used on a stand-alone basis, Master Trainers could have been exposed to comfar III as well.

There could have been interaction between the two sub-contracts and sub-contract II could have compared the suitability of comfar III in Energy Audit software.

Of course, the involvement of financial institutions to objectively comment on the relevance of the two software packages with regard to their own evaluation procedures for funding energy efficiency projects would have been useful.

The project has been effective in addressing the issues connected with the key objectives.

F. Capacity Building

The project has identified and prepared

- Policy Makers in the MOA, TVE, with their involvement in the project implementation and especially with their participation in the fellowship programme to US and Study Tour to UK, in understanding the policy barriers and have had the exposure on the practices and policy environment pertaining in developed countries to improve energy efficiency.
- Training and Service Institutions which can be upgraded to disseminate information and offer training to TVE on Energy Auditing and Management.
- 30 Master Trainers developed to use the Training package developed for providing Training in the Training Institution and enterprises.
- Portfolio of Energy Efficiency technologies developed for TVE to adopt and benefit.
- Information of TVE products for market available for dissemination.

The gap seems to be in the involvement of financing institutions under the TVE set up to be instilled with the knowledge and the need for financing energy efficiency projects.

This aspect could be addressed while finalizing the project document of Phase II.

H. Impact

The project has immense capacity to instill the energy efficiency culture in the better organized and comparatively large and medium enterprises. The effect on environment with the capability to implement energy efficiency projects will be highly beneficial. However their applicability to the small enterprises is a matter of doubt. MOA is convinced about the benefits of energy efficiency programme and is seriously looking forward to the commencement of Phase II.

I. Sustainability

TVE have a large network of training and service institutions. There is competition among them to be among the best 500 TVE as recognized and rewarded by MOA. Currently the emphasis is to meet the production targets. Once the benchmarks are accepted for energy consumption best practices, technology choice and financing mechanisms, the TVE are likely to realize reduction in energy use and GHG emissions.

As the energy efficiency portfolios have been developed, training package with Master Trainers developed, training and service institutions identified along with 8 demonstration sites, enough capacity has been built to continue the efforts locally. MOA is spending considerable time, apportioning staff, networking with training and service

institutions and is keen to pursue the project to the logical conclusion and carry forward the programme further.

The contribution provided by MOA is much more than the budget apportioned by them. It is their commitment to the project which is of greater value. The project has laid the foundation for sustaining the efforts.

J. Follow-up

The project is being continued to the next Phase II. The Project Brief for Phase II has set the objective of removing key barriers to implement the identified pilot projects by:

- Establishing incentives and monitoring systems to strengthen on-going efforts to enforce existing laws and regulations at the county level.
- Providing the capacity for implementing TVE based energy conservation and product improvements in rural areas.
- Creating access to commercial financing for 8 pilot projects which addresses investment risks and facilitates future investments.
- Creating the mechanisms for commercialization and replication of the energy conservation investments at the national level.

Phase I has generated enough enthusiasm, commitment and general level of preparedness to implement the pilot projects. Phase II, primarily targeted towards this end, needs to be initiated without further loss of time to take advantage of the motivation levels persisting among the various stakeholders.

V. FINDINGS

1. Relevance

The most important findings are:

a) In China, TVE are grass-root industrial enterprises and are crucial for developing the rural economy. In view of their genre and scale of operation, they generally exhibit performance levels lower them the SOE. China wishes to enhance the capabilities of TVE on a parallel track realizing their limitations.

b) China is committed to sustainable development as a signatory to the UNFCCC and is keen to develop capabilities among the TVE for implementing energy efficiency and pollution control measures to reduce GHG emission.

2. Performance

c) Four sub-sectors namely brick marking, cement, coking and metal castings among the TVE consume 47.2 percent of the TVE energy consumption

contributing to 57.5 percent of the GHG emissions. Hence these four sub-sectors have been selected for identifying energy efficient technologies suited to TVE, market for the products, financing for the energy efficiency projects and policy measures which act as barriers.

d) Further strategy of removing barriers by selecting 8 pilot project sites with identified training and service institutions and master trainers indicate the preparedness for the TVE system to usher in an energy efficiency culture and pollution control compliance regime.

e) The project could have been enriched further if financial institutions involved with TVE such as farmers' foundation, co-operatives, local banks, agricultural banks apart from commercial banks were associated in the project activities namely

   i. survey of financial institutions
   ii. Evolving the training package
   iii. Training to evolve Master Trainers
   iv. In appreciating comfar III for feasibility studies
   v. In development of software package on Energy Auditing and Management

Such a step would have led to better understanding among the financial institutions to evolve their strategy for lending to energy efficiency projects and greater understanding of others in appreciating the requirements of financing institutions.

- With the inputs from financial institutions Energy Efficiency manuals for each of the sub-sector could have been developed with benchmarks for energy consumption, technology choice, market information and financing arrangements compatible with TVE financing regimes. The suggestion mainly stems from the diverse financing option for TVE which are not necessarily from commercial banks.
- The survey findings and the selection of the 8 demonstration pilot projects indicate the benefits accruing to the large and medium enterprises. For small enterprises a different approach may be needed.
- While the project meets the overall objectives set, the commitment with regard to 30 percent involvement of women in the project does not seem to have been met.

3. Success

Otherwise the project has been on outstanding success in realizing the objectives set and has achieved the physical targets with minimum deviation from the original project document with marginal time overrun and costs within the stipulated budgets with minor modifications.

VI RECOMMENDATIONS

The MOA and UNIDO could note the findings and may like to bring about cohesion among the barrier removal institutions; particular emphasis could be to draw the financial institutions actively in the exercise.

A parallel energy conservation project with international co-operation (European Union) for the SOE has developed the capacity for Energy Service Companies. Their experience could be tapped while embarking on Phase II.

VII LESSONS LEARNED

The project is a good model for emulation with respect to project design. The strategy of identifying barriers and barrier removal strategy are unique.

The project has involved grass root organizations involved with TVE and built up capability and capacity to undertake energy efficiency projects in the relatively large and medium TVE.

The strengthening of rural economy by making TVE energy efficient and GHG emission reduction will improve the quality of life and make TVE more competitive.

The project has tilted in favour of technology identification and the barriers to overcome them. It is weak on financing of energy efficiency projects-evolution of bankable projects as per the requirements of the TVE financing systems. This issue could be addressed while finalizing the Project Document for Phase II.

Annexure – I

Terms of Reference for the Evaluation Mission

Project No: CPR/95/G31
Project Title: Energy Conservation and Pollution Control in Township and Village Enterprises in China

Background

The township and village enterprises (TVEs) in China are major energy consumers. The brick-making, cement, coking and metal casting sectors of the TVEs are the 4 chief contributing sectors to greenhouse gas (GHG) emissions. These sectors accounted for 57% the total TVE emissions of 117.8 million tons of CO2 in 1995. The project was designed in two phases. The objectives for Phase I project were: 1) to prepare GEF proposals for a Phase II Project addressing barriers in commercializing energy efficiency and GHG reduction technologies, and 2) to develop capacities in implementing Phase II project.

It is a GEF project executed by UNIDO and implemented by the Ministry of Agriculture (MOA). The project was approved in December 1997 and began in operation in early 1998. GEF provides US Dollar 1 million to the project, and the government provides RMB yuan 3 million. After more than a year implementation, most of the project activities have been completed and the evaluation is due to be conducted.

The GEF Project Brief for Phase II was approved at the GEF Council meeting in May 1999, and the Phase II Project Formulation is planned for July 1999.

Objective of the Mission

The objective of the evaluation is to review in details the design, the performance and the results of the Phase I Project. The mission will document findings and recommendations, where possible, for the improvement of the current project. The mission findings will also feed directly into the formulation mission for the Phase II Project.

Scope of the Evaluation

1. Comprehensive review of the project concepts and design to determine

   a) if the project meets the GEF mandate and the government development priorities;
   b) if the problems were clearly identified, the immediate objectives were properly defined and the approaches to address them were appropriate;

c) whether the risks were fully acknowledged and taken into account;

d) if there are the major changes from the original project design, and if yes, what are the reasons for such changes;

2. Detailed evaluation of the project performance (timeliness, quality and quantity) in accordance to the project document, including

a) inputs delivered by the Government, the UN agency, the subcontractors and UNDP in comparison to the produce of the outputs;

b) cost-effectiveness of activities undertaken to achieve the immediate objectives and the outputs in comparison with the work plan;

c) achievements of the immediate objectives and the outputs;

d) efficiency of project management and institutional framework;

e) technical backstopping received from the executing agency;

f) completion of the two subcontractors;

3. Assessment of the Impact of the Project

a) whether the project made contribution or likely to contribute to greenhouse gas reduction and to promote energy efficiency in the TVEs;

b) effects on the target beneficiaries and other stakeholders;

c) if the expected end-of-project situation was met;

4. Recommendations and Lessons Learned with regard to

a) major problems in project implementation;

b) any negative effects;

c) improvements that the second phase should be aware of in the formulation.

Mission Composition and Duration

The mission will consist of one international consultant for duration of two weeks in July 1999. The NPD will suggest an itinerary and designate a staff from the project institute to support to the mission.

Output and Reporting

The consultant will report to UNDP and work closely with UNIDO and the Ministry of Agriculture. The consultant will complete a draft evaluation report and the project evaluation information sheet and will debrief UNDP, UNIDO and MOA at the end of the mission in China. Finally, the expert will accommodate the comments from agencies concerned, which should be made available prior to the departure of the expert, into the evaluation report and submit the finalized report to UNDP within two weeks after receipt of the comments.

As the evaluation mission is planned to overlap with the beginning of the Phase II formulation mission, the consultant will also provide direct recommendation to this formulation mission.

Qualifications:

Candidate must have an advanced degree from a recognized university or institute, and have worked in the area of energy sector or related environmental economics for 10 years. He/she must have broad knowledge about energy conservation and familiar with the GEF projects. Prior experience with UNDP assistance and working in China would be highly desirable.

(Draft of 12 July 1999)

Annexure – II

EG/CPR/95/G31 – Energy Conservation in China's TVEs
Evaluation Mission Schedule, 15 – 30 July 1999

Date	Time	Activities	Participants	Venue
15 July (Thurs)	Afternoon	Arrival in Beijing	V. Raghuraman	Sheraton Hotel
	5:00 PM	First briefing	V. Raghuraman, UNDP, UNIDO	UNIDO Conference Room
16 July (Fri)	9:00 AM	Joint briefing	MOA, UNDP, UNIDO and the subcontractors (ERI, AEPI)	UNDP large Conference Room
	PM	Review documents	V. Raghuraman	UNIDO Conference Room
17, 18 July (Sat, Sun)		Review documents	V. Raghuraman	Beijing
19 July (Mon)	9:00 AM	Briefing and discussion	Ministry of Agriculture (MOA)	MOA
20 July (Tue)		Briefing and discussion	ERI (Subcontract I)	Beijing
21 July (Wed)		Traveling to Tianjin for briefing and discussion	AEPI (Subcontract II)	Tianjin
22 July (Thurs)		Visit to AEPI and TVEs and back to Beijing	AEPI (Subcontract II)	Tianjin
23-26 July (Fri-Mon)		Drafting evaluation report	V. Raghuraman	Beijing
27 July (Tue)	9:00 AM	Distribution of draft evaluation report to all parties for review	UNDP	Beijing
28 July (Wed)	11:00 AM 3:00 PM	Tripartite Review Meeting (TPRM) Meeting with KL UNDP ResRep	MOA, UNDP, UNIDO, ERI, AEPI, V. Raghuraman	MOA UNDP
29 July (Thurs)		Finalize evaluation report	V. Raghuraman	Beijing
30 July (Fri)	1:00 PM	Departure with flight CA109	V. Raghuraman	

Annexure-III

LIST OF PERSONS MET

UNDP	Ms. Kerstin Leitner Mr. Dennis Fenton Mr. Miao Hongjun	Resident Representative Cluster manager Senior Programme Officer
UNIDO	Mr. B. Sugavanam	Representative China Mongolia, DRP Korea
MOA	Mr. Wang Xiwu	Director, NPD
	Mr. Liu Tong Zhan	Vice-Director
	Mr. Shangbin Gao	Director of PMO
	Mr. Li Jungming	Director, Senior Engineer
	Ms. Cai Li	TVE Programme Officer Engineer
ERI	Mr. Wang Zhongying	Deputy Director, Senior Energy Economist
	Ms. Hu Runqing	Asst. Professor
AEPI	Mr. Tao Zhan	Director , Prof. Vice President of Chinese Society of Agno-emiron. Prof.
	Mr. Shao Yilong	ASSOC. Prof.
	Mr. Boi Qingyun	Director, Research Associate

Annexure-IV

LIST OF DOCUMENTS REVIEWED

UNIDO

1.	Energy Conservation in TVES	-	Substantive Reports
		-	Substantive BL-II (BL 51)
		-	Substantive -PDS -Finance -Evaluation

MOA

1.	Report on UK study tour	-	6-19 June 1999
2.	Summary of the study tour to the USA	-	22 Nov. 1998 – Jan. 21, 1999
4.	The first study tour report of the GEF/UNDP Project		

ERI

1.	First Progress Report	a.	Summaries of Desk study
		b.	criteria for selecting TVE sites to host Demonstration projects
		c.	Design and Distribution of questionnaires for TVEs
		d.	Description of Data Base Data type stored
2.	Second progress Report	a.	NCG constitution
		b.	First NCG meeting-Participants, Deliberations, conclusions and suggestions
3.	Third Progress Report	a.	Organization of four Sub-sector workshops
		b.	Agenda of the workshop
		c.	Conclusions and Recommendations
		d.	Participation list
		e.	Pre-feasibility study for selected Demonstration Sites
4.	Fourth progress Report	a.	Integrating Assessment Report of capacity of domestic energy saving service Institutions for TVEs in China

5. Fifth Progress Report
   a. Barriers for the implementation of Energy Conservation and pollution control in TVEs of China
   b. Analysis of existing Bank and Financial System in China
   c. Relationship between Phase I and Phase II of the Project
   d. Strategies of the barrier removal for Implementation of the project

6. Sixth Progress Report
   a. pre-feasibility study using COMFAR III software for selected demonstration sites on
      - coking
      - metal casting
      - brick making
      - cement

AEPI

1. A planning proposal for bidding for subcontract 2
2. First progress report
   a) Training Package
   b) Implementation of the first stage of the project
      - Design of curriculum
      - Expert Teachers
      - Didactic Materials
      - Teaching material
      - Co-ordination with overseas tour
      - Framework organization
      - Communication of project team with various organizations

3. Second Progress Report
   a) Amalgamation of overseas study tour into teaching material
   b) Refinement of conspectus
   c) Tailor of teaching materials
      - Formulation of users guide and booklet manual
      - Experts to referee for manuscript
      - Making of video tapes
      - Check up on training Materials
      - Study and Discussion by experts
      - Printing Teaching Materials, Users' guide and preliminary version of Training programme
      - Pilot Training Programme
      - Conduct
      - Evaluation

4. Third Progress Report
   a) Training Programme
      - objectives and significance
      - candidates, qualification and aim of the trainees
      - teaching Materials
      - computer Software
      - Preparation of site and department
      - Recruiting students
      - Arrangement of courses
      - Study tour and case Analysis
      - Examination
      - Feed back-quality Assessment
      - Identification of the training mechanism by the authorities
      - Characters of the training class