

Terminal Evaluation Review form, GEF Independent Evaluation Office, APR 2015

1. Project Data

Summary project data			
GEF project ID		261	
GEF Agency project ID		557	
GEF Replenishment Phase		GEF-1	
Lead GEF Agency (include all for joint projects)		UNDP	
Project name		Capacity Building for the Rapid Commercialization of Renewable Energy in China	
Country/Countries		China	
Region		East Asia & Pacific	
Focal area		Climate Change	
Operational Program or Strategic Priorities/Objectives		OP6: Promoting the Adoption of Renewable Energy by Removing Barriers and Reducing Implementation Costs.	
Executing agencies involved		UNDESA ; National Development and Reform Commission (NDRC); State Environment Protection Agency (SEPA), State Economic and Trade Commission (SETC)	
NGOs/CBOs involvement		N/A	
Private sector involvement		[secondary executing agency; one of the beneficiaries; through consultations] e.g. Long Yuan Electric Power Company; Jilin Wind Power Company	
CEO Endorsement (FSP) /Approval date (MSP)		January 7 th , 1999	
Effectiveness date / project start		1999 (TE,p.25)	
Expected date of project completion (at start)		12/31/2004	
Actual date of project completion		12/31/2006	
Project Financing			
		At Endorsement (US \$M)	At Completion (US \$M)
Project Preparation Grant	GEF funding		
	Co-financing		
GEF Project Grant		8.802 (PD, proposal for review, p.1)	N/A
Co-financing	IA own	0.5 (PD, proposal for review, p.1)	N/A
	Government	4.12 (PD, proposal for review, p.1)	N/A
	Other multi- /bi-laterals	14.231 (PD, proposal for review, p.1)	N/A
	Private sector		
NGOs/CSOs			
Total GEF funding		8.802 (PD, proposal for review, p.1)	N/A
Total Co-financing		18.851 (PD, proposal for review, p.1)	N/A
Total project funding (GEF grant(s) + co-financing)		27.653 (PD, proposal for review, p.1)	N/A
Terminal evaluation/review information			
TE completion date		12/2007	

Author of TE	Jerome Weingart; Eugenia Katsigris
TER completion date	12/29/2015
TER prepared by	Chenhao Liu
TER peer review by (if GEF IEO review)	Molly Watts

2. Summary of Project Ratings

Criteria	Final PIR	IA Terminal Evaluation	IA Evaluation Office Review	GEF IEO Review
Project Outcomes	S	NR	NR	S
Sustainability of Outcomes	Risk level: Low	NR	NR	L
M&E Design	NR	NR	NR	MU
M&E Implementation	NR	NR	NR	MU
Quality of Implementation	NR	NR	NR	S
Quality of Execution	NR	NR	NR	S
Quality of the Terminal Evaluation Report	-	-	-	U

3. Project Objectives

3.1 Global Environmental Objectives of the project:

“The global environmental objective of the project is to reduce CO2 emissions by beginning the process of replacing fossil fuels with the use of renewable energy sources.” (PD, proposal for review, p.6)

3.2 Development Objectives of the project:

“The development objective of the Capacity Building for the Rapid Commercialization for Renewable Energy in China Project was “the widespread adoption of renewable energy sources in China by removing a range of barriers to increased market penetration of the technology.” This objective was supported by two major immediate objectives:

- Development of national capacity for the rapid commercialization of renewable energy in China.
- Removal of barriers to four promising renewable energy technologies.” (TE, p.19)

The project has 5 technical focus areas, including: Wind Assessment; Hybrid Village Power Development; Industrial-Scale Biogas Development; Solar Water Heating Development; and Bagasse Co-Generation.

3.3 Were there any **changes** in the Global Environmental Objectives, Development Objectives, or other activities during implementation?

There were no changes in Global Environmental Objectives and Project Development Objectives, and the project logic framework was maintained throughout the project process. However, the Project’s detailed structure and expected deliverables have occasionally been modified. For instance, “Bagasse cogeneration market studies have been dropped from the Project because the NDRC has decided to do this as part of their biomass national action plan.” (PIR 2006, p.14) The project had two revisions to extend the project: the first one extended the project to Dec/31/2005, and the second one confirmed a one year close-out period up to Dec/31/2006.

4. GEF IEO assessment of Outcomes and Sustainability

Please refer to the GEF Terminal Evaluation Review Guidelines for detail on the criteria for ratings.

Relevance can receive either a Satisfactory or Unsatisfactory rating. For Effectiveness and Cost efficiency, a six point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess. Sustainability ratings are assessed on a four-point scale: Likely=no or negligible risk; Moderately Likely=low risk; Moderately Unlikely=substantial risks; Unlikely=high risk. In assessing a Sustainability rating please note if, and to what degree, sustainability of project outcomes is threatened by financial, sociopolitical, institutional/governance, or environmental factors.

Please justify ratings in the space below each box.

4.1 Relevance	Rating: Satisfactory
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The TE didn't rate the project's outcome relevance. In a binary scale (Satisfactory/Unsatisfactory), this TER will rate the strategic relevance of the project's outcome as "Satisfactory". The project belongs to the GEF Focal Area- Climate Change, and is consistent with GEF OP (Operational Program) 6: Promoting the Adoption of Renewable Energy by Removing Barriers and Reducing Implementation Costs. The project is also in line with the country's development priorities as the Chinese government "has been open to complementing government programs with a market-oriented approach to further develop, disseminate, and commercialize renewable energy technologies." (TE, p.19)

4.2 Effectiveness	Rating: Satisfactory
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Although spending long chapters documenting the success of project results, the TE didn't specify the project's outcome achievements under each specific component. However, the PIR 2006 (as of June 30 2006, a few months before project closure) provided relevant information, and rated the "progress toward meeting the objective" as "Satisfactory". This TER will rate the project's outcome effectiveness as "Satisfactory" based on the analysis of evidence presented by the PIR 2006 and the TE, as per below.(PIR 2006, p.3-6) The project has successfully reached the majority of its expected outcomes.

The project outcome has components:

Outcome 1: Creation of a favorable environment for commercial adoption of renewable energy

There are three targets under this outcome:

At the baseline, it was expected more than 50 cumulative capacity-building events will be organized by the end of the project (EOP) with the aim of strengthening capacity in government, business, and financial organizations for realizing commercialization of renewable energy. This target was achieved.

The PIR 2006 reported a cumulative number of more than 50 events under this target have been organized by June 30 2006.

Another target is launching the SWH (Solar Water Heater) certification program for SWH products and starting testing services for industry at the national testing centers. This target was also achieved. By the EOP, all of the project's contracted technical activities in this area were finished. A standards base for testing and characterization of the country's SWH technology or products was developed, with 3 national testing centers (2 of which fully accredited) established. The first 14 companies passed testing and certification for SWH products and technology.

The last target of "Wind resources assessment completed in line with international standards at project's 10 sites, and development of the database and site characterization studies for the Project's 10 sites" was achieved. By the EOP, a validated database for projects and site characterization studies for the project's 10 sites was developed and the preliminary investigation for the assessment results from the 10 project sites was ongoing.

Outcome 2: Widespread adoption of renewable energy technologies

There are a number targets under this outcome:

Regarding the project's support for the country's policy making, the project was expected to "1. Support the Renewable Energy Law legislation through the NDRC; 2. Contribute to the strategic planning processes of the central government." These two targets were fully achieved. By the EOP, The project provided assistance to the NDRC in developing implementing regulations for the Renewable Energy Law (REL). In addition, it provided a formal set of recommendations to the NDRC for increasing the sustainability of the national township electrification program, and for implementation of the national village electrification program. Also the project contributed to the development of draft regulations for the management of a utility cross-subsidy fund under the REL (Renewable Energy Law) for supporting renewable energy commercialization and other details for feed-in tariffs and quota systems; the project supported the NDRC strategic planning activities in the Energy Bureau. Specifically, it provided technical assistance for the development of the China's National Wind Roadmap and National Roadmap for Biogas Development.

With the aim of increasing market penetration of renewable energy, the project was expected to assist in completing the following activities by the EOP "1. National RESCO (rural energy service company) training program will be conducted and the baseline survey will be established for the Song Dian Dao Xiang Program support; 2. Tai Hu Regional Development Workshop will be completed." Target 1 was achieved, but there is no evidence for the achievement of target 2. By the EOP, the National RESCO training program was organized in the form of 2 management training workshops for personnel involved in the national rural electrification programs, and a baseline Survey for the *Song Dian Dao Xiang* (sending power to township) program was completed. However, by the EOP there was still no evidence of organization of the Tai Hu Regional Development Workshop.

At the baseline, the project also proposed a number of quantitative targets by its technical focus area under the project's outcome 2. Specifically:

- **Wind: 1000 MW of development potential from 10 project sites is established, in support of NDRC National Wind Development Program plan for 4000 MW by 2010. This target is 20% achieved and further progress toward it is ongoing. EOP value: 200 MW of wind generation was installed in 10 wind**

sites, Another 600 MW in various stages of development. There is still a gap compared with the target of 1000 MW of identified wind development potential.

- **SWH: 14 million m²/year of production from China SWH industry, cumulative installation of 60 m². National Testing and Certification Program for SWH products is in place and is expected to stimulate market expansion beyond the project’s tenure. This target was fully achieved. EOP value:** In 2005 the SWH system production in China was approximately 16 million square meters (cumulative = 80 million square meters). National Testing and Certification Program has been established to fully support the continued development of the solar water heating market in China with quality control mechanisms in place to support the manufacturing sector. 14 of the leading SWH manufacturers accounting for around 70% of China SWH production were already certified during the pilot phase of the program.

- **Hybrid Village Power: Support for sustainable deployment of 1066 village power systems under Song Dian Dao Xiang equal to 17 MW of rural energy installations. Start of *Song Dian Dao Cun* (transporting electricity to village) program in scope of Project’s tenure, which over 20 years may deploy 200 MW of village systems in 20,000 villages. This target was not achieved, and its actual achievements are not relevant to the target. EOP value:** Baseline Survey of the *Song Dian Dao Xiang* (transporting electricity to township) program was completed. A set of recommendations was provided to the NDRC for solutions to several institutional issues impacting the sustainability of the project.

- **Bagasse Cogeneration: Assessment of restructuring in the sugar industry and potential for bagasse cogeneration. This target (assessment) was only partly achieved in the form of a completed evaluation of a single pilot project. EOP value:** evaluation of the pilot project was completed for the installation of a 13 MW steam turbine generator for a cogeneration in a sugar mill in Guitang, Guangxi Province.

- **Biogas: Stimulation of up to 60 new plants by end of program. Commercial foundation in project will be the basis for achieving government targets for 2020. This target was not achieved, and its actual achievements are not relevant to the target. EOP value:** Evaluation and assessment report was completed for the Qingdao Jiuchang Alcohol Distillery Project in Shandong Province. Evaluation and assessment reports were completed for two biogas projects in Sichuan that also use the biogas generated by the plants to produce electricity. A feasibility study was completed for a commercial 2MW biogas pilot plant for Jiaxing, Zhejiang representing a transition to commercial power generation using biogas as a fuel (this project using pig farm waste products).

It is clear from the above analysis that, majority of the targets have been fully achieved or on the track of being achieved, thus a rating of “Satisfactory” for the project’s outcome effectiveness is justified.

4.3 Efficiency	Rating: Moderately Satisfactory
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Based on relevant evidence presented by the TE, this TER will rate the project’s outcome efficiency as “Moderately Satisfactory”.

The TE didn’t give a definite rating for the project’s outcome efficiency, but its summary of project outcomes provided some relevant assessment: “In spite of the highly complex project design, the sheer breadth of activities, the time consuming procedures for subcontracting and site selection, the Project has managed to fulfill its objectives in a reasonable amount of time and with high quality”(TE, p.152) This

shows that the TE holds a positive opinion on the project’s outcome efficiency. For the project’s timeliness, the project was finished in 7 years, during which two one-year extensions were granted. Although reasons for the extensions were not specified, the TE reported that “some activities and outputs were delayed by specific issues with local cost-sharing or by changing situations and local conditions. Government restructuring and other national events led to unavoidable delays.(TE,p.25) And, the change of UNDESA’s management philosophy has led to further delays in the close-out phase of the Project. (TE, p.145)

Overall, the project has been able to reaching its goal with efficiency, but with some administrative delays. A rating of “Moderately Satisfactory” is justified.

4.4 Sustainability	Rating: Likely
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The TE didn’t give explicit ratings for the project’s sustainability. Instead, it analyzed the potential for sustainability of project achievements by the project’s 5 technical focus areas.

This TER will rate the project’s sustainability as “Likely”, based on the individual assessment of four categories of sustainability as per below drawing on key information from the TE and PIR 2005-2006:

Financial Resource Sustainability- Likely

Some financial resources were committed to sustain the project’s impacts, and the financial risks to the project’s sustainably are low. The TE reported some immediate financial support was provided to sustain the impact of the project (not the project itself):” i. The Project resulted in the formal initiation of the long-term wind resource assessment national project in China, which secured a total of RMB 300 million (about US\$40.7 million) of financial support from the national budget; ii. The results of the Project prompted the government to establish a national target for building 100 biogas power plants in China.” (TE, p.148)The project’s 2006 PIR rated external financing as “non-critical”, and the 2005 PIR rated it as “low risk”, because to “All projects are completed at this point with respect to financing issues.”(PIR 2006, p.43). The project’s 2006 PIR reported that “CREIA is functioning as a fully self-sustaining organization.” (PIR 2006, p.44) The low rating for the project’s financial risks is a proof of sufficient financial support for the project’s technical focus areas, which is a fact also contributed by the high achievement of project outcomes.

Socio-political Sustainability-Likely

The project’s social and political sustainability is likely. The project’s main objective is to promote the commercialization of renewable energy in China, and it ended up with marked socio-economic benefits and achievements which would not have been possible without strong social and political support in the country. According to the comment from a government official, “With the foundation that this Project has constructed to assist the government in its support of renewable energy, the future is bright for the continued trend of policy development in the central government, and in renewable energy investment

and commercial development.”(TE, p.148). Also, there are no potential risks identified by the PIR 2005-2006 related to the project’s social-political sustainability.

Institutional Sustainability- Likely

The project’s institutional sustainability is likely. The project’s institution building component is highly recognized by the government due to the project’s consistency with the country’s development priorities, and related institution building efforts will continue. As reported by TE, “the Project has been implemented in parallel with the development of renewable energy in China, and, with its support, many of the policies that now support renewable energy have been established through the Renewable Energy Law, implementing regulations, and the national standards and certification system. Many more such policies are expected to be established even after the Project has reached its conclusion.” (TE, p.149) In addition, the PIR 2005-2006 confirmed the institutional risks identified at the beginning of the project were insignificant. The low rating of these institutional risks by the PIR confirms the project’s institutional sustainability.

Environmental Sustainability-Likely

The project’s environmental sustainability is likely. The Final PIR didn’t identify any environmental risks for the project (PIR 2006, p.13). The TE also reported that the environmental impacts of the project’s different technical focus areas are being sustained or having promising perspective for sustainability due to the further growth of China’s renewable energy market after the project. (TE, p.152-153) Thus, by supporting the growth of renewable energy market in China, the project is also contributing to its long-term environment sustainability by itself.

5. Processes and factors affecting attainment of project outcomes

5.1 Co-financing. To what extent was the reported co-financing essential to the achievement of GEF objectives? If there was a difference in the level of expected co-financing and actual co-financing, then what were the reasons for it? Did the extent of materialization of co-financing affect project’s outcomes and/or sustainability? If so, in what ways and through what causal linkages?

The TE mentioned that the project “was co-financed jointly by the UNDP through the Global Environment Facility (GEF), the Government of the Netherlands, the Government of Australia’s AusAID Program, and the Government of China (GOC).” The TE didn’t report the actual level of co-financing materialized. The PIR 2006 reported that the estimated level of co-financing expected to be disbursed by the end of the project is 25.76 million, which is slightly less than the 26.57 million committed at the baseline mentioned in the project document. The project’s outcome achievement is high, and there was no linkage specified between the co-financing and outcome achievement by relevant policy documents.

5.2 Project extensions and/or delays. If there were delays in project implementation and completion, then what were the reasons for it? Did the delay affect the project’s outcomes and/or sustainability? If so, in what ways and through what causal linkages?

Originally, the project was expected to be completed within 5 years by December 31th 2004. The

project reported that “some activities and outputs were delayed by specific issues with local cost-sharing or by changing situations and local conditions. Government restructuring and other national events led to unavoidable delays. Some adjustments were made to the original scope of the Project Document as market conditions in China changed and also through the normal learning process of the government and PMO (Project Management Office) in the Project.” (TE, p.25) To accommodate these delays, a one-year extension to December 31st 2005 was granted. In addition, some changes of management philosophy at UNDESA in the final year entail delays in some activities for project close-out, which led to another one-year extension to December 31st 2006. There has been no linkage specified by relevant policy documents between project delays and outcome achievements.

5.3 Country ownership. Assess the extent to which country ownership has affected project outcomes and sustainability? Describe the ways in which it affected outcomes and sustainability, highlighting the causal links:

Relevant policy documents didn’t provide any comments on country ownership. But as a nationally owned project with marked benefits toward the public sector, communities, and industries, the project has received a high-level of country support, which is also proved by the satisfied outcome achievements. The TE could have provided more details on the linkage between project’s outcome achievement/sustainability and country ownership.

6. Assessment of project’s Monitoring and Evaluation system

Ratings are assessed on a six point scale: Highly Satisfactory=no shortcomings in this M&E component; Satisfactory=minor shortcomings in this M&E component; Moderately Satisfactory=moderate shortcomings in this M&E component; Moderately Unsatisfactory=significant shortcomings in this M&E component; Unsatisfactory=major shortcomings in this M&E component; Highly Unsatisfactory=there were no project M&E systems.

Please justify ratings in the space below each box.

6.1 M&E Design at entry	Rating: Moderately Unsatisfactory
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The TE didn’t render an assessment of the project’s M&E system. Based on relevant information presented by the project document, this TER will rate the M&E design at entry as “Moderately Unsatisfactory”. The project has set up its plan for M&E, which only contains information on administrative arrangement with no mention of the M&E framework.

According to the project document (PD), the project will be subject to tripartite review (TPR) by representatives of the Chinese Government, UNDP and UNDESA at least every 12 months after the start of project implementation, and the TPR is established to “review progress in light of the project document, identify problems, if any, and decide on the corrective actions and responsibility of each party. (TE, p.28) Arrangement for Mid-term Evaluation and Terminal Evaluation was also set up, under the supervision of STEC, UNDESA, UNDP and with the participation of other donors. (TE, p.28)

However, the project’s M&E design is incomplete. Importantly, the project didn’t define a comprehensive M&E framework under which specific indicators would be chosen to measure the project’s progress towards target outcomes. The PD includes a part where a list of expected activities to be conducted under each of the project objectives was laid out (PD, p.14-23), however this is insufficient for monitoring the project’s progress toward its expected outcomes. The lack of a well-defined M&E framework would make the entire M&E activity ad hoc and unsystematic. Thus, a rating of “Moderately Unsatisfactory” for the project’s M&E design at entry is justified.

6.2 M&E Implementation	Rating: Moderately Unsatisfactory
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The TE didn’t rate or provide any relevant details about M&E implementation. This TER will rate the M&E implementation as “Moderately Unsatisfactory” based on evidence presented by the TE and PIRs. The M&E implementation partly corrected the incomplete M&E design, but it still had marked some shortcomings, especially the format of the TE.

From the relevant project documents available (PIR 2000-2006), it is clear that UNDP has managed to align the program’s monitoring with the UNDP’s standard. Specifically, in each standardized UNDP PIR, the progress toward achievement of the two components of project outcomes were assessed through comparing the target value, baseline value, and current value of the same 5 indicators (outcome 1 two indicators; outcome 2 three indicators) throughout the years. Each of the PIRs from 2000 to 2006 also reported relevant financial information as of that specific fiscal year and assessed the risks to the project implementation. Although the MTR (Mid-term Review) document is not available, the TE confirmed the completion of the MTR “upon which the TE was built.” (TE, p.13)

However, the TE was not in line with GEF requirements in its format. It didn’t assess the project’s key areas in line with GEF requirements and provide corresponding ratings, and it didn’t present the outcome achievements/recommendations/lessons learned in a clear-cut and consistent manner. This, however, can constitute a significant shortcoming of the M&E implementation for which a non-positive rating can be justified.

Overall, standardization of M&E implementation and the quality of TE are areas that the project could have performed better, thus a rating of “Moderately Unsatisfactory” for the M&E implementation is justified.

7. Assessment of project implementation and execution

Quality of Implementation includes the quality of project design, as well as the quality of supervision and assistance provided by implementing agency(s) to execution agencies throughout project implementation. Quality of Execution covers the effectiveness of the executing agency(s) in performing its roles and responsibilities. In both instances, the focus is upon factors that are largely

within the control of the respective implementing and executing agency(s). A six point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess.

Please justify ratings in the space below each box.

7.1 Quality of Project Implementation	Rating: Satisfactory
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For this project, UNDP is the GEF-implementing or funding agency. The TE didn't provide an explicit rating for the quality of project implementation considering the performance of UNDP in backstopping and supervising, but it provided some relevant evidence fragmented throughout the entire document. Consistent with the project's successful execution, the project implementation under the adequate supervision and backstopping has been successful, for which this TER will rate as "Satisfactory".

In general, "UNDP has been able to demonstrate the importance of a multi-stakeholder approach to project development. UNDP was able to quickly respond to policy maker needs on a quick turnaround basis which enabled the legal process to move more swiftly and relatively smoothly as needs arose. For example, UNDP was able to quickly program funds to support the renewable energy policy tours when this was determined to be a priority. "(TE, p.140) "UNDP played a key role in coordinating donor support and in leading the international response to supporting the development of the RE legislation." (TE, p.139).

For UNDP's backstopping in specific project area: "UNDP made a contribution to the recognition by government of the importance of wind energy resource assessment and standardization of this process." (TE, p.162) For the SWH (Solar Water Heating), "UNDP support shortened the time to develop the national standards and testing and certification procedures by 5 – 7 years. " (TE, p.4) "For the Village Power, UNDP has taken a leadership role in promotion of productive uses for village power systems, to move beyond the narrow and unsustainable focus on provision of consumptive uses of electricity." (TE, p.159) Inadequate staffing by the PMO has been an issue over the course of the Project. The Project was understaffed over the life of the project. In this case, UNDP provided some staffing resources, with the remainder to be provided by government counterparts. (TE, p.145)

UNDP is also contributing to the sustainability of the project. "The UNDP/Beijing is now currently assisting the Energy Leading Group of the State Council during preparation of the new "Energy Law," which is more general legislation covering energy policy, but which includes renewable energy and energy efficiency issues." (TE, p.141)

7.2 Quality of Project Execution	Rating: Satisfactory
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The TE didn't rate the quality of project execution. The project's executing agency is the UNDESA with the assistance of China's Central Government (State Economic and Trade Commission / China National

Development and Reform Commission, State Environment Protection Agency). Considering the evidence presented by the TE on a successful record of project execution, this TER will rate it as “Satisfactory”

The TE notes that “overall, the implementation of the project followed the plan of the original Project Document. Many activities and outputs were completed within budget and on schedule.” (TE, p.25) The project required revision due to changes in China between the time of project design and implementation, and the TE notes that “project management communication through annual and semi-annual reports and Advisory Group meetings allowed for opportunities to revise the scope of the Project Document.” (TE, p.25) The performance reports were and financial statements were timely and accurate. (TE p.26) The midterm evaluation noted that the project management office was understaffed at 6 people, with the key support of a UNDESA Project Manager based in New York.

8. Assessment of Project Impacts

Note - In instances where information on any impact related topic is not provided in the terminal evaluations, the reviewer should indicate in the relevant sections below that this is indeed the case and identify the information gaps. When providing information on topics related to impact, please cite the page number of the terminal evaluation from where the information is sourced.

8.1 Environmental Change. Describe the changes in environmental stress and environmental status that occurred by the end of the project. Include both quantitative and qualitative changes documented, sources of information for these changes, and how project activities contributed to or hindered these changes. Also include how contextual factors have contributed to or hindered these changes.

The project has focused on capacity-building for commercialization of renewable energy and upgrading of the country’s environmental governance system, and relevant project documents have not reported any significant immediate environment changes.

8.2 Socioeconomic change. Describe any changes in human well-being (income, education, health, community relationships, etc.) that occurred by the end of the project. Include both quantitative and qualitative changes documented, sources of information for these changes, and how project activities contributed to or hindered these changes. Also include how contextual factors have contributed to or hindered these changes.

Relevant project documents didn’t provide summaries on the project’s entire socio-economic change. However, the TE included a study on socio-economic impact the Bulunkou (a township) Pilot Project, which is part of the “Hybrid Village Power Development” arm of the project:

With the coming-in of power, “One of the most obvious effects has occurred because of television, which has brought information about the outside world, educational programs, and entertainment into village homes. “ (TE.p.64) the Bulunkou school and health clinic, both of which have been able to acquire new equipment and as a result attract more students and patients, respectively, as well as professional staff.

At the Bulunkou school, 34 new computers with Internet access were introduced in 2006. Other electronic equipment in the schools contributes to an increase in teaching capacity for the local educators, including allowing use of educational videos and reception of satellite educational programs. High-quality electric light has replaced candles and kerosene lamps and has allowed students to study during evening hours while women produce carpets and handicrafts. The Bulunkou Township health clinic has acquired new medical equipment, including an x-ray machine (powered by a separate dedicated diesel genset) and EKG machines, and has expanded services for women and children. A more adequate power supply also gave birth to more grocery stores, restaurants, repair shops, more tourism, and importantly, increase in both income and income equality. (TE, p.64-65)

8.3 Capacity and governance changes. Describe notable changes in capacities and governance that can lead to large-scale action (both mass and legislative) bringing about positive environmental change. “Capacities” include awareness, knowledge, skills, infrastructure, and environmental monitoring systems, among others. “Governance” refers to decision-making processes, structures and systems, including access to and use of information, and thus would include laws, administrative bodies, trust-building and conflict resolution processes, information-sharing systems, etc. Indicate how project activities contributed to/ hindered these changes, as well as how contextual factors have influenced these changes.

a) Capacities

The TE and relevant project documents provided fragmented evidence on the changes in capacities:

More than 50 capacity-building events were held for Government, business, and financial organizations to promote the commercialization of renewable energy.

SWH (Solar Water Heating): In 2005 the SWH system production in China was approximately 16 million square meters (cumulative = 80 million square meters). National Testing and Certification Program was established to fully support the continued development of the solar water heating market in China with quality control mechanisms in support of the manufacturing sector. 14 of the leading SWH manufacturers accounting for about 70% of China production were already certified during the pilot phase of the program.

Wind: 200 MW of wind generation was installed in 10 wind sites, and another 600 MW in various stages of development. A validated database for 10 project sites and site characterization studies for these sites were completed. Preliminary resource assessment investigation for 10 sites results was completed.

RESCO (Rural Energy Service Company) Training: 2 management training workshops were conducted for personnel involved in the national rural electrification programs in China.

“The results of the Project prompted the government to establish a national target for building 100 biogas power plants in China, and the Project helped to promote the use of biomass pelletization technologies for practical applications in rural areas to increase the convenience of gathering and utilizing biomass

feedstock. The technologies are easy to deal with, and the decentralized characteristics also fit well with the realities of rural conditions.”(TE, p.148-149)

b) Governance

The TE and relevant policy documents provided fragmented evidence on the changes in capacities:

SWH (Solar Water Heating) Testing and Certification Program: Standards base for the testing and characterization of SWH components and systems were developed; 3 national testing centers were established with 2 fully accredited (the third to complete accreditation in 2006); Product certification program was launched with a Gold Star labeling system for commercial products and customer recognition.

“The Project was directly responsible for mandating SWH installation regulations, which are now in place, and also helped to develop regulations that mandate the installation of SWH systems in hospitals, department stores, schools, etc, that can now be seen in many areas of China; The Project helped to convince the national government to decide to build solar PV grid-connected demonstrations as concessions, using competitive public bidding to select the project developers and investors.”(TE, p.149)

“The Project has been implemented in parallel with the development of renewable energy in China, and, with its support, many of the policies that now support renewable energy have been established through the Renewable Energy Law, its implementing regulations, and the national standards and certification system. Many more such policies are expected to be established even after the Project has reached its conclusion. “(TE, p.149)

Hybrid Village Power: A set of recommendations were provided to the NDRC (China National Development and Reform Commission) for solutions to several institutional issues impacting the sustainability of the project.

8.4 Unintended impacts. Describe any impacts not targeted by the project, whether positive or negative, affecting either ecological or social aspects. Indicate the factors that contributed to these unintended impacts occurring.

Relevant project documents didn't identify any unintended impacts of this project.

8.5 Adoption of GEF initiatives at scale. Identify any initiatives (e.g. technologies, approaches, financing instruments, implementing bodies, legal frameworks, information systems) that have been mainstreamed, replicated and/or scaled up by government and other stakeholders by project end. Include the extent to which this broader adoption has taken place, e.g. if plans and resources have been established but no actual adoption has taken place, or if market change and large-scale environmental benefits have begun to occur. Indicate how project activities and other contextual factors contributed to these taking place. If broader adoption has not taken place as expected, indicate which factors (both project-related and contextual) have hindered this from happening.

No immediate follow-up replication and scale-up was in place, however the project's achievements are being sustained by its stakeholders through other activities, such as "The UNDP/Beijing is now currently assisting the Energy Leading Group of the State Council during preparation of the new "Energy Law," which is more general legislation covering energy policy, but which includes renewable energy and energy efficiency issues." (TE, p.141)

9. Lessons and recommendations

9.1 Briefly describe the key lessons, good practices, or approaches mentioned in the terminal evaluation report that could have application for other GEF projects.

Industrial Biogas

Lessons Learned (TE, p.158):"

- To have an impact on the commercialization of new biogas technology (and any other innovative technology), it is essential to identify and work with the leading edge industry and private sector innovators (HEEEEC) and early adopters of the technology.
- The Project-supported pilot projects were especially effective in promoting technology adoption and commercial deployment, including attracting enormous government, customer, and media attention and interest.
- The combination of successful pilot projects and regional workshops focused on business development are very effective in promoting commercialization. The regional workshops for the customer base resulted in many commercial contracts for industrial biogas plants.
- A focused and consistent approach affected a paradigm shift in the industrial biogas field within the lifetime of the UNDP Project.
- It is essential to speak the institutional language and to address the needs of each key stakeholder (government, industry, customers, international development support agencies, etc.)."

Village Power

Lessons Learned (TE, p.159-160):"

- The international community, in providing effective support to the government, needs to work in coordination.
- Having flexibility and the capacity for rapid response provides the ability to take advantage of major opportunities that were not anticipated in the early stages of project design and initiation. This can result in far greater impacts than originally contemplated. This is essential for GEF projects that "overdesign" the initial approach.
- Be careful of specifying the demand. The international community had been asking for village power in China. When it came (State Council to NDRC), the scale was unprecedented and no one was prepared for implementation.
- The UNDP Project was not able to work in the Village Power project design and development phase. The Project was able to work in the subsequent design and development stage. UNDP/GEF has to be a major player from the beginning.

- To achieve sustainability in village power systems, it is essential to establish funds and mechanisms for developing the O&M infrastructure, revenue collection and management, training for technicians and managers, development of productive applications, tariffs, etc.
- It is essential to conduct baseline surveys and periodic surveys during the course of the Project to monitor and assess social and economic project impacts as well as management performance.
- Concentrate on domestic systems integration and supplier base: major dependence on international suppliers and systems integrators is not a sustainable or affordable approach.
- There is a need to establish standards for village power systems components, system design approach, and systems performance. For example, the NREL hybrid power test facility is a good model for similar facilities that should be developed in China.

Solar Water Heating (SWH)

Lessons Learned (TE, p.161):

- By working at the national level and with the appropriate government agencies, it is possible to enhance project outcomes through development of a national program.
- Consolidating Project resources and focusing on an integrated national program of standards development, testing, and certification allowed for the maximum impact. This was not in the original Project design. (This was also done for wind and for VP systems.)
- The use of a multi-stakeholder process is very effective in development of national standards and getting government and industry support.
- International standards cannot be enforced on China, but these standards serve as important guideposts for the standards design and development process.”

Wind

Lessons Learned (TE, p.162):

- China must have its own wind resource assessment capacity and cannot depend solely on external expertise. However, ongoing international collaboration with leading wind resource assessment organizations is essential in order for China to establish its own world-class assessment capacity.
- For the wind measurement program, the Project had to achieve a fine balance between working with a professional team immediately or building capacity in experienced organizations. The latter may slow down the Project and compromise project quality. Capacity building should be integrated with professional execution.
- UNDP Project flexibility is required in order to adapt effectively to unexpected events such as the restructuring/deregulation of the Chinese electric power industry
- Bureaucratic contracting procedures can result in significant delays. It is easier to deal with domestic procurement than international procurement, but this requires an external review.
- Procurement and contracting procedures need to be streamlined.”

Project Management

Lessons Learned (TE, p.163):”

- Support the multiple stakeholder process with workshops and other information and with data exchange.
- Project management has been effective but overburdened, and could have achieved even more with more effective staffing levels, in line with other multilateral staffing levels. The World Bank REDP PMO, which managed a project similar in size to the UNDP Project, but had a more narrow focus, operated with 10 staff during the entire lifetime of the project.
- UNDP PMOs need to have the resources and mechanisms to hire and retain top people. Otherwise the huge investments in time, training, and networking with the key PMO staff are lost as these staff leave for better paying positions.
- The UNDP Project Document was not an operational plan, and a separate management plan had to be developed in order to implement the project.”

9.2 Briefly describe the recommendations given in the terminal evaluation.”

The TE provided its recommendations by the project’s technical focus areas, as per follows:

Wind Assessment

Recommendations (TE, p.46-48)

Future work in this sector should continue to support policy, planning, certification, testing, and training, building on the accomplishments made during the project period. Going forward, UNDP should focus on the macro perspective of resource assessment and training, as the domestic industry will carry on the micro-siting work.

Specific recommendations follow.

- *Improve Analysis*

China needs more accurate and creative analysis for its wind sites. It is suggested that some capacity building work be done in this area. In addition, there is a need to combine the assessment results of the ten sites with results from NREL to get meso-scale maps.

- *Ensure Sound Bidding*

During the Project period, bidding was focused overwhelmingly on the lowest price bid rather than the soundness of the technical proposal. The result was prices that were too low. Going forward there is the need ensure that the bidding process also considers technical issues in addition to cost.

- *Need for Quality-Control in Manufacturing*

The manufacturing sector would benefit from work in testing and certification.

- *Offshore Wind Development*

Offshore wind is a promising area for the country's renewable energy market as the country possesses vast potential in this area due to geographical reasons. It deserves more attention in future policy planning.

- *Focus on Macro Support*

Changes that occurred in the power sector since the Project's initiation have shifted the need to macro support from the detailed type of site support that was more appropriate when the Project started. Given the rapid development of the wind sector and the strengthening of the industry, the needs now are country-wide rather than project-specific. This entails more work in policy planning, certification, testing, and training.

- *Need for Training*

Training is an important area in which international cooperation could help. China's installed wind capacity is doubling each year. There are over 30 companies now involved in wind manufacturing, and ten in other aspects of the sector. To both sustain and support the pace of development, training must be widespread and consistent.

Hybrid Village Power Development

Recommendations: (TE, p.69-71)

- **Government Relations.** A priority of actions of next steps is to raise awareness at the high-level officials' on the higher importance of sustaining the project's existing achievements than further expanding the project towards reaching the goal of 100% power coverage nationwide. More efforts will be also needed to persuade responsible high-level officials for ensuring the financial support for sustaining the project's existing achievements in this area.
- **Technical Assistance.** Future training should include both technical training and training on the management of renewable energy systems. Both are important to ensure the sustainability of this project's impact. Because of frequent turnover of operators, a training program to certify new operators is needed to ensure sustainability. Guaranteeing the salaries of system operators will also go a long way toward staff retention.
- **Rural Electrification Research.** Ongoing research by the Government should be continued regarding the next steps in increasing the coverage of electricity in the rural area.
- **Cross Subsidy for Grid Applications.** The implementation of grid cross-subsidy that is included in the Renewable Energy Law should be carefully planned, taking consideration of its potential risks.
- **Socioeconomic Impact Assessment for Rural Energy.** Finally, though there have been useful studies on the socioeconomic impact of rural energy projects, more work should be done in this area, especially in terms of economic impact.

Industrial-Scale Biogas Development

Recommendations (TE, p.89-90):

- There are three main areas in which future UNDP projects should consider to focus: The first is fuel ethanol, utilizing cassava, sweet potato, and sugarcane. The wastes from processing of these feedstocks have very high potential for biogas. The second main area for potential focus is municipal waste, such as the solid wastes from big hotels and restaurants. To date, this is an unexploited resource in China. Third, small and medium-sized livestock farms have received little attention to date. There is a need to determine the best use of electricity generated by biogas installations on these farms.
- As for the needs of the existing installations, the general manager of the Qingdao distillery has emphasized the need for a cost-effective technology to solidify the liquid fertilizer. Further research in this area is needed.

Solar Water Heating (SWH) Development

Recommendations (TE, p.116-121):

- There is tremendous momentum in the SWH market now, and it is worth considering additional international support for increasingly rigorous and comprehensive standards, testing, and certification.

Need for Stricter Testing, Standards, and Mandatory Certification

- Based on the above section, one obvious area for continued support is moving the SWH industry up the final notch to meet international standards. Although in some areas the Chinese products are close to international standards, overall there is still a significant gap toward reaching parity in terms of product quality with European products; Testing in the areas of system lifetime, component lifetime, stability of performance, and corrosion, and addressing specific “disaster points” of the industry, would help to move the testing and certification program more toward the needs of the market; Technology testing standards in particular should be strengthened. The focus was originally on product standards, but there is a need for testing standards to guide research and development. These require more advanced technology and investment. The quality of hardware and software in testing laboratories should be also strengthened; On the good basis of the two national testing centers established, the testing infrastructure should be expanded in the future to a larger space, higher level, and more comprehensive scope.

Integrating SWH in New Building Construction

- Though integrating SWH in new building construction was not included specifically in the Renewable Energy Law, the Ministry of Construction has set up a separate code for SWHs in new building construction—“Technical code for solar water heating systems for civil buildings.” It is anticipated that there will also be new building construction requirements to accommodate SWHs. Policy support/research should be geared to supporting this area.

Energy Savings Labels

- Similar to the development of the EnergyStar label of the U.S. Environmental Protection Agency and Department of Energy, a follow-on project for China could include development of a labeling program for different levels of energy savings. This would obviously apply to SWHs as well as other products.

Targeting the Rural Market

- There are already rural households in places like Henan that have SWHs, but in other remote areas, such as Xinjiang Province, they have not yet arrived. So far none of the national rural electrification programs has provided SWHs to remote areas, but this is needed.

Building Prohibitions on Installation of SWHs

- One of the most important barriers to the development of the SWH industry is that property managers of more than half of the urban residential complexes in China prohibit their residents from installing SWHs. Follow-on work is therefore merited in this area, and could include developing a new law or implementing regulation. This work might be based on study of international experiences, such as that in Germany.

Targeting Large-Scale Users

- Another area worth future attention is the market for large-scale users of SWHs, such as hotels, schools, and hospitals.

Bagasse Co-Generation

Recommendations (TE, p.126):

- The Guitang project achieved promising results especially in terms of gains in efficiency. In the future, experience of this project should be publicized and promoted within the sugar industry, to make mill owners aware of the benefits of investing in new, higher-efficiency co-generation equipment.
- Future investigations might consider using the leaves and other parts of the sugarcane as fuel for power generation, in addition to the bagasse, based on international case studies.

Institutional Development

Recommendations (TE, p.134)

- CREIA (China Renewable Energy Industries Association) will need to continue to emphasize fund raising to ensure self-sufficiency and finance growth and expansion for the organization. This will require expanding the number of members and providing quality member services.
- Managing CREIA's growth will be important as renewable energy continues to expand in China. A strong business plan will be useful, as will effective leadership.

Policy and Planning Support (TE, p.142)

Recommended next steps include the following:

- The current Renewable Energy Law in China is fairly in general, and many details for implementation have yet to be worked out. Priorities of the next steps include: developing national general targets; preparing a national renewable plan; establishing grid-connected pricing mechanisms; determining cost sharing measures; arranging financial back-up measures in rural areas; preparing renewable energy development specifications; establishing technical criteria for solar integration, renewable energy resource assessments, grid connection and other national standards; and clarifying the role of hydropower in the Renewable Energy Law. Additionally, assistance will be needed in the development and implementation of the National Middle and Long Term Plan for Renewable Energy; the 11th Five Year Renewable Energy Development Plan; and the Solar Building Economic Policy.
- The approach used to support renewable energy policy and law development in China can be applied in other developing countries supported by UNDP, GEF, and other donors.
- UNDP/Beijing is working with the Financial and Economic Committee of the NPC (National People's Congress), providing US\$500,000 for revision of China's Energy Conservation Law. This activity can benefit from the documented experiences of the UNDP-GEF Project.
- The UNDP/Beijing is now currently assisting the Energy Leading Group of the State Council during preparation of the new "Energy Law," which is more general legislation covering energy policy, but which includes renewable energy and energy efficiency issues. Some of the adjustments to be made to the Renewable Energy Law will be made in the Energy Law legislation."

Project Management

Recommendations (TE, p.147):

- Project managers and key personnel need to have the requisite skills before assuming the position. Terms of reference for these positions should be clear with eligibility criteria specified.
- Salary and compensations for project staff should be competitive as compared to the market price.
- On contractual issues, since little can be done regarding the UN procurement process in NY, it will be important for the PMO (Project Management Office) to use locally qualified bidding agents to the extent possible as these contracting processes for these entities can be performed in a more timely and efficient manner.
- In the future, donors should use more coordinated with streamlined reporting requirements."

10. Quality of the Terminal Evaluation Report

A six point rating scale is used for each sub-criteria and overall rating of the terminal evaluation report (Highly Satisfactory to Highly Unsatisfactory)

Criteria	GEF EO comments	Rating
To what extent does the report contain an assessment of relevant outcomes and impacts of the project and the achievement of the objectives?	The TE spent some chapters documenting the project's achievement, but in a fragmented, vague, and unspecific way.	Moderately Unsatisfactory
To what extent is the report internally consistent, the evidence presented complete and convincing, and ratings well substantiated?	The TE is not in line with standard format of TE typical of UNDP project, it didn't provide any ratings.	Unsatisfactory
To what extent does the report properly assess project sustainability and/or project exit strategy?	The TE assessed the project's sustainability, but its organization of analysis is not in line with GEF's requirements; it didn't mention project exit strategy.	Unsatisfactory
To what extent are the lessons learned supported by the evidence presented and are they comprehensive?	Lessons learned summarized by the TE are thorough, but they were not presented in a clear-cut approach which makes it difficult for readers to find them among paragraphs.	Moderately Satisfactory
Does the report include the actual project costs (total and per activity) and actual co-financing used?	No reporting	Highly Unsatisfactory
Assess the quality of the report's evaluation of project M&E systems:	No reporting	Highly Unsatisfactory
Overall TE Rating: :		Unsatisfactory

11. Note any additional sources of information used in the preparation of the terminal evaluation report (excluding PIRs, TEs, and PADs).

In the preparation of this TER, no additional documents were referred to as the source of information apart from PIRs, TE, and PD.