


United Nations Development Programme

Project of the Government of
The People's Republic of China

Final Evaluation

of

Barrier Removal for Efficient Lighting Products and Systems in China

UNDP Project Number
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Final Evaluation of the China Green Lights Program

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Contents

List of Acronyms

AQSIQ	State Administration for Quality Supervision, Inspection and Quarantine
BNIC	Bureau of the National Industry and Commerce
CALI	China Association of Lighting Industry
CECIC	China Energy Conservation Investment Corporation
CECP	China Certification Center for Energy Conservation Product
CFL	compact fluorescent lamp
CICETE	China International Centre for Economic and Technical Exchanges
CIE	Commission International de l'Éclairage (Int'l Comm. on Illumination)
CNIS	China National Institute of Standardization
CTA	Chief Technical Advisor
DERC	Department of Environment and Resources Conservation (within NDRC)
EE	energy-efficient
ELI	Efficient Lighting Initiative (an IFC/GEF project)
ERI	Energy Research Institute
FTL	fluorescent-tube lamps
GEF	Global Environment Facility
HID	high-intensity discharge lamps
HPS	high-pressure sodium
IFC	International Finance Corporation
LPD	lighting power density
MEPS	minimum energy performance standards
MOC	Ministry of Construction
NDRC	National Development and Reform Commission
NIST	National Institute of Standards and Technology (U.S.)
NVLAP	National Voluntary Laboratory Accreditation Program (U.S.)
PMO	Project Management Office (of the China Green Lights Program)
SARS	Sudden Acute Respiratory Syndrome
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Program
WTO	World Trade Organization

List of Tables and Figures

Acknowledgments

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Executive Summary

PROJECT BACKGROUND

The China Green Lights project is a Chinese Government and UNDP/GEF joint initiative to improve the quality of Chinese efficient lighting products and to stimulate the demand for these lighting products both nationally and internationally. The project formally commenced in July of 2001, with full implementation beginning in September of 2001, and will be completed by December 2005.

This report is the final evaluation of the project. The primary purpose of this evaluation is to establish the degree to which the project has achieved its specified goals; to make recommendations for future actions; and to highlight any lessons to be learned.

MILESTONES

It is the view of the evaluator that the outputs associated with the immediate objectives have been largely fulfilled. A review of the 15 major milestones against the project log frame has established that all of:

- 8 milestones have been fully achieved; and
- 7 milestones have been exceeded;

Total energy saving in Chinese lighting in 2004 resulting from the activities of the project has been 15.78 billion kWh (equivalent to US$986 million savings in electricity costs to the consumer). The cumulative savings in lighting energy since project initiation in 2001 have been 25.54 billion kWh (equivalent to US$1,596 million savings in electricity costs to the consumer).
The estimated emissions related to lighting in 2004 were reduced by 4.3 million tonnes of Carbon with cumulative reductions in Carbon emissions of 6.8 million tonnes of Carbon since project initiation.

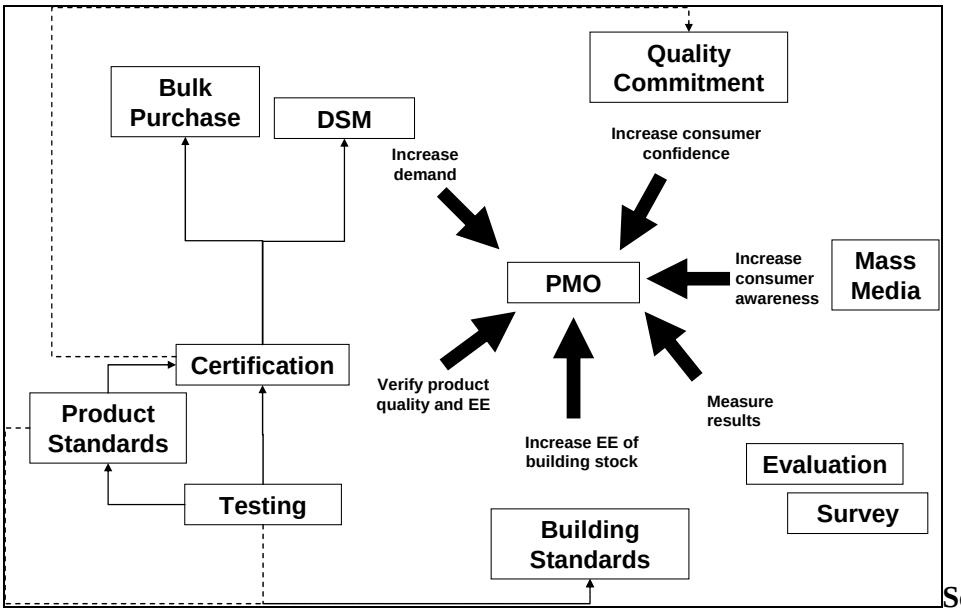
QUANTITATIVE EVALUATION

The Project has achieved success along a number of different quantitative indicators. A few of the main results are listed here:

- electricity savings estimated at 15.78 billion cumulative kWh through the end of 2004 (equivalent to US$986 million savings in electricity costs to the consumer);
- reduction of 4.9% in lighting electricity use for 2003;
- cumulative reduction of 6.8 million tonnes of CO_2 as carbon (C);
- increase in share of automated lighting production lines from 2001 to 2003;
- increase in the ratio of high-efficiency products to low-efficiency products.
- average lifetime of electronic ballasts doubled, from 8,000 to 15,000 hours;
- output and exports of high-efficiency lamps increased substantially (approx. 40%) from 2002 to 2003, but there was no baseline established for comparison;
- aggregated, overall awareness of high-efficiency lighting products increased; and
- the share of high-efficiency lighting products increased from 32.1% in 2002 to 34.7% in 2003.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion 1: Project Design is Effective and Well Integrated



Schematic View of Project Elements in Green Light Project.

The following overall observations can be made based on interviews with the sub-consultants and manufacturers:

- The testing, product standards, and certification acted as the pillar upon which the pilot programs (bulk purchase, DSM, and quality commitment) were based.
- 6 product standards were developed and approved, for double-capped fluorescent tubes; CFLs; high-pressure sodium lamps and ballasts; and metal halide lamps and ballasts.
- More than 600 lighting products were certified from 46 firms for 8 different lighting product types.
- The pilot programs – especially the bulk purchase and DSM – were largely effective and met their goals. In a strategic sense, it is important to note that *they served as drivers for manufacturers to get their products certified.*
- The Quality Commitment Program, although limited in scale, has demonstrated the viability of using certification as the basis for providing a retailer guarantee that will increase consumer confidence.
- Standards for lighting power density were developed for 7 types of buildings and street lighting for the first time. The Chinese government has already used its own money to train 10,000 engineers and designers on the technical aspects and implementation of the new standards..
- The survey produced much valuable data as input to the evaluation; however, the lack of clearly detailed TOR for the quantitative indicators, and the decision to separate the survey and evaluation sub-consultants, limited the effectiveness of these project elements.

- The mass media sub-consultant was very active, and produced a number of articles, trained journalists, provided supporting materials to schools and villages, and assisted in preparation of TV shows. However, compared to the other elements, the mass media was somewhat of a disappointment. There was broad agreement among those interviewed for this evaluation that the mass media activity lacked an adequate budget and resources to be able to make an impact on consumer awareness.
- The quantitative evaluation shows a significant impact of the Green Lights Project in terms of electricity savings; percent reduction in lighting electricity consumption; and a number of other market measures.

Lesson Learned
The most effective project design relies on multiple partners playing their roles, and supporting each other toward an overall goal. However, this type of project design carries risks (since more things can go wrong.

Conclusion 2: The PMO is Well Managed and Should Not Close Down

The Project Management Office (PMO) received universal praise and support from the sub-consultants interviewed. The only significant recommendations for improvements were in the area of information flow and data availability. Many of the sub-consultants felt that possible shut-down of the PMO at the end of 2005 would be a threat to the continuity of the overall Green Lights efforts. A long delay without a PMO could have serious impacts on the longer term viability of China Green Lights, as the delay would cause the private sector to lose interest and confidence in the program.

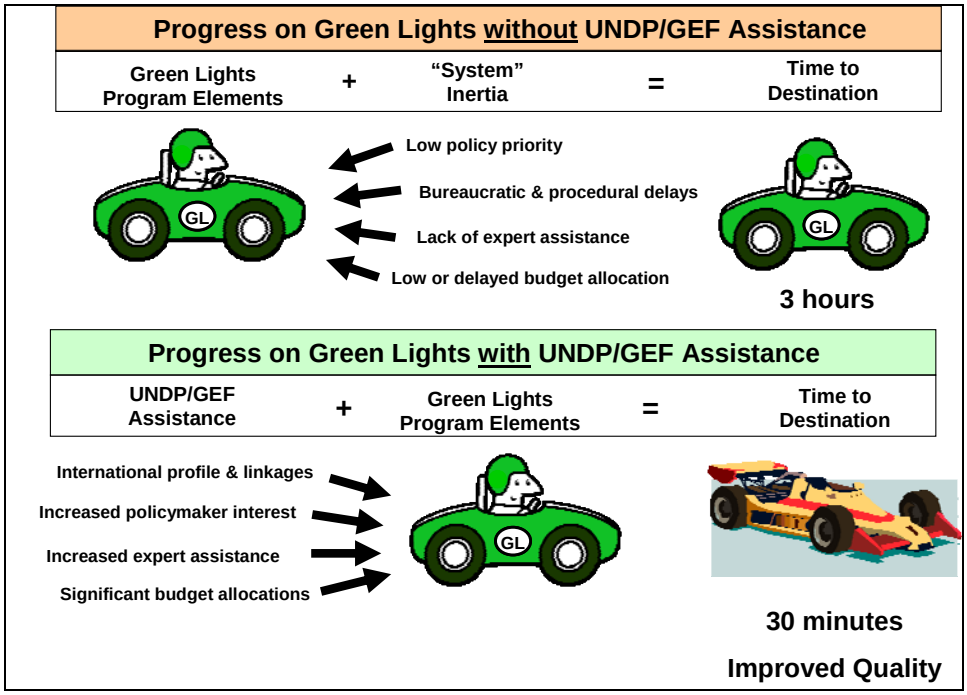
Lesson Learned
For an effective PMO, it is important to have a central organization, with stable staffing, and dedicated to the PMO function (i.e. not distracted by other job responsibilities).

Urgent Recommendation: Maintain a transitional PMO
As a high priority recommendation, we urge the Chinese government to allocate adequate funding for a transitional PMO starting on 1 January 2006. In order to maintain focus and efficiency for Green Lights, it is important for that the PMO team remain independent and not become subsumed within another organization.

Conclusion 3: UNDP Has Played a Critical Role in Improving Lighting Efficiency

Interviews with the sub-consultants led to the clear impression that the UNDP/GEF assistance was essential to achieving the impressive results of the last four years. The figure below shows a "mental model" we have developed to describe the impact of UNDP/GEF funding. Without the outside funding: progress would have occurred but quite slowly. Some examples of this include the lack of previous government approval of budgets to update the building lighting standards; and the statement by the certification sub-contractor that certification

schemes were developed for approximately four times as many product types due to the outside assistance.



Schematic Showing Examples of How UNDP/GEF Assistance Expedites Program Results

Recommendation: Separate "Old" from "New" Green Lights elements

The Old Elements are activities and processes that UNDP/GEF has already funded, and where Chinese actors have developed the capacity to successfully execute the activities. These elements could be funded by the Chinese government. The New Elements are activities and processes where China particularly needs input and value added from an outside funder or expert(s) in order to be able to "learn" a new skill or achieve results. These elements are candidates for international support. We see a risk of continued UNDP/GEF support of the Old Elements. Old elements that were proven successful should be funded by the Chinese government. If the Chinese government continues to rely on outside funding for these core processes of the Green Lights Project, this may delay the transition to Chinese ownership and support.

Lesson Learned

Funding agencies should "embed" their funded activities in ongoing organizational roles and activities

For the most part, UNDP funded activities that were ongoing. UNDP funding helped things go "faster" and "more effectively." Activities that were not "embedded" in the role of the organization did not work as effectively (e.g., mass media).

The Old Elements are activities and processes that UNDP/GEF has already funded, and where Chinese actors have developed the capacity to successfully execute the activities. The New Elements are activities and processes where China particularly needs input and value added from an outside funder or expert(s) in order to be able to "learn" a new skill or achieve a result. These elements are candidates for international support:

We see a risk of continued UNDP/GEF support of the Old Elements. If the Chinese government continues to rely on outside funding for these core processes of the Green Lights Project, this may delay the transition to Chinese ownership and support. For example, *given the massive energy savings identified from the MEPS, certification, bulk purchase, DSM, and quality commitment activities, it appears that these programs justify substantial state support. In addition,* ***this conclusion has been validated by the inclusion of in the China Medium and Long-Term Energy Conservation Plan****.*

Recommendation: Build on momentum of Right Light 6: improve English web site and international coordination and outreach

The Right Light 6 Conference, held in Shanghai during May 2005, was a major success and attracted international participants from all over the world. Given the importance of China's links to the global lighting community, it is vital for the China Green Lights Program to build on the momentum of the Right Light Conference and improve its English web site and international coordination and outreach.

Conclusion 4: Manufacturers Are Not Using the CECP Endorsement Logo on Their CFLs

The most obvious market gap we identified is that most manufacturers are not using the CECP logo on their CFL products. One reason for this is that the consumer market forms a small percentage of sales for many of the manufacturers. Another is the perception among manufacturers that there is very low or no awareness of the CECP logo among purchasers.

The manufacturers we interviewed, as well as the sub-consultants, agreed that consumer awareness of the certification logo is very low, and that this will not be remedied without a massive advertising and marketing effort. The consensus was that the supplier certification was being mainly driven by the desire of the suppliers to qualify for sales through the three pilot projects: DSM, bulk purchase, and quality commitment.

Recommendation: Streamline process of testing and compliance for CFLs.

Manufacturers indicated that the process of testing for MEPS, as well as certification for the CECP logo is complicated, time-consuming and expensive. During our discussions, it was recommended that the whole process be streamlined and simplified in order to reduce compliance costs and overhead. The recommended solution was "One-Stop Compliance" for manufacturers: testing of the CFL in order to satisfy the MEPS requirement and also qualify for certification.

Recommendation: Develop Labeling and Awareness Task Force to develop integrated labeling strategy for EE lighting.

The PMO should coordinate establishment of a Labeling and Awareness Task Force that

would bring together CNIS, CECP, manufacturers, and other stakeholders to design an integrated label that would facilitate testing, certification, and identification of the efficiency and quality of all lighting products. The format of the label would be decided based on the consultation; and it should be possible option to also "integrate" the endorsement label into the comparative label, as has been done in the energy labeling schemes in Australia and the United States.

Conclusion 5: Survey and Evaluation Functions Should be Combined

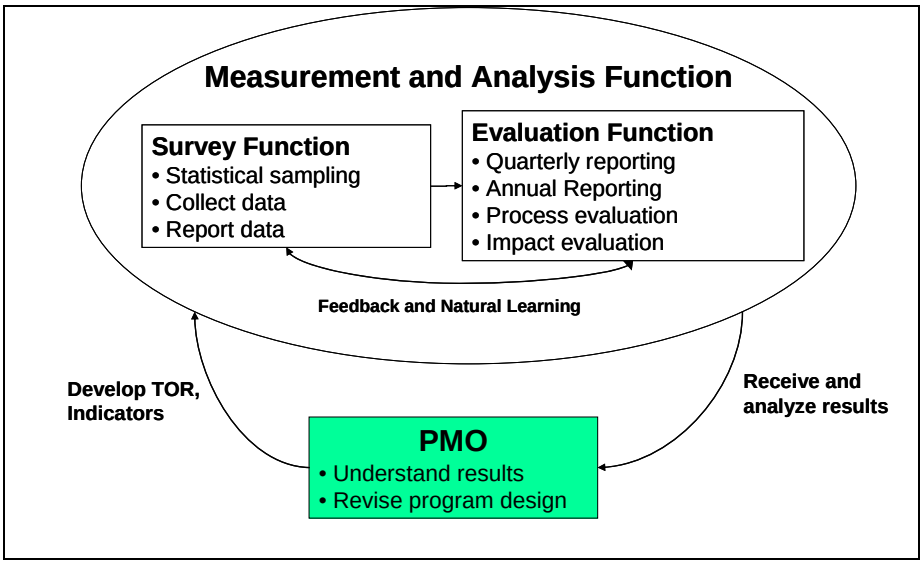
We observed a number of problems with the survey and evaluation function. The main problem appears to be an inefficient management structure, with unnecessary institutional separation of the survey and evaluation functions.

Recommendation: Combine survey and evaluation functions in Green Lights III Project

The survey and evaluation functions should be integrated into a single team that possesses skills and experience in market research, as well as process and impact evaluation techniques. This will provide a clearer focal point for the evaluation function, as well as strong leadership for this important management and monitoring function (see figure).

Recommendation: Review the current survey questionnaires and indices, and decide on long-term tracking surveys.

The PMO will also need to justify continued government support for the survey and evaluation function. If this function is lost, or delayed for even a year, it will make it much harder to understand and measure the benefits of the China Green Lights Program. And without the ability to understand and measure the benefits, the current strong national and international support for the program may be harder to maintain in the future.



Schematic Showing Desired Integration of Measurement and Analysis Functions.

Conclusion 6: CICETE Played a Critical Role by Improving the Efficiency of Project Administration

CICETE (the China International Center for Economic and Technical Exchanges) handled recruitment, negotiations and contracting for personnel and equipment on the project, as a service to NDRC the Implementing Agency. With CICETE handling the project logistics, especially bidding and contracting, this allowed the PMO to focus on project implementation and strategy.

Lesson Learned
Having an administrative agency handle the administrative and procurement aspects of a project can make the implementation much more efficient. Otherwise, the project staff spend time on procurement and administrative activities where they do not have well developed skills, and this takes away from the effectiveness of project implementation.

Recommendation: Promote the CICETE model to other countries and aid agencies.
UNDP should develop a strategy for promoting the CICETE model to other countries that are implementing development projects. UNDP could write a case study of the role of CICETE on UNDP projects in China in general, and its role as the administrative agency on China Green Lights in particular. This case study could be disseminated and promoted to UNDP client countries, as well as institutions such as GEF, the World Bank, IFC, and other multilateral and bilateral agencies. The benefits are clear, since the national agencies implementing many development projects end up spending a large fraction of their time on procurement-related activities.

Conclusion 7: Lack of Concrete Action Plan for Continuation of the Pilot Programs

There is no doubt that the DSM and bulk purchase pilot programs were highly successful in strategy and execution. However, the current model relies heavily on a rebate, which is not sustainable at present, as there are no general mechanisms from Chinese sources that can continue to fund rebates for the purchase of EE lighting equipment.

Rebates may be necessary for a period of time to continue to drive the market transformation impacts of the Green Lights Program. However, the rebates should be scaled back and actively managed. And during Green Lights III, the rebates should be "blended" funding to demonstrate a commitment by the Chinese government to the concept of rebates, and to reduce the program's dependence on foreign funds for incentives.

Recommendation: Develop a short-term and long-term strategy for continuation of the pilot programs
The short-term strategy should outline how to continue the bulk purchase and quality commitment programs through a management fee that would be requested from the Chinese government. A longer-term strategy will also need to be developed to include the DSM programs.

SUSTAINABILITY ISSUES

An important objective of this evaluation was to assess the viability and ongoing sustainability of the program and its sub-components. It appears that implementation of activities during the project period was quite successful. However, there are a number of questions related to sustainability that are raised by the end of the UNDP funding. These questions mainly stem from the fact that there is a lack of a clear Action Plan for moving forward.

Based on our review, we made the following conclusions regarding sustainability:

- While nearly all of the projects performed well during the UNDP-GEF-funded Green Lights Project, one of the main barriers going forward is budget support.
- While the Chinese government has named China Green Lights one of the top 10 energy-efficiency projects in its Medium and Long-Term Energy Conservation Plan, there is, as yet, no detailed Action Plan and budget for the continuation of China Green Lights.
- We assessed two of the projects to be "high" on the sustainability index. These were Certification Labeling and the Energy Management Companies. Both of these companies have a clear business plan and revenue stream.
- We assessed the three pilot programs (Quality Commitment, Bulk Purchase, and DSM) to be "medium" on the sustainability index. While these activities appear to be viable, the main barrier is a the lack of a business plan and budget commitments for 2006 and beyond.
- We assessed 4 of the projects to be "low" on the sustainability index:

- Product and Building EE Standards do not currently have a budget allocation from the government to develop further, high-quality standards for energy-efficiency of additional building types and lighting products.
- There is no budget allocation or government plan to continue the promotional efforts to support China Green Lights.
- There is no budget allocation or government plan to continue the survey and evaluation activities to support China Green Lights.

Lesson Learned
The assessment of sustainability indicates that the "sustainability component" of the project should have started in the beginning of the project, rather than half-way through. In addition, the sustainability strategy may have benefited from more active involvement by UNDP. Since the key issue revolves around UNDP-GEF principles for funding possible follow-on work, as well as UNDP-GEF's expectations about sustainable activities, the project would have benefited from a more direct and consistent ongoing dialogue between UNDP-GEF and NDRC about each parties expectations for, and interests in, Green Lights III.

SUMMARY OF THE MAIN CONCLUSIONS OF THIS EVALUATION

Overall, the primary conclusions from this evaluation can be summarized as follows:

- The China Green Lights Project was very well designed and managed.
- The project has met all its milestones, on time, and achieved a significant market and energy impact.
- The project should continue, with support from Chinese government as well as targeted international support
- This report makes a number of specific recommendations for the next phase of Green Lights.
- There are also lessons learned that can be useful for the next phase of Green Lights as well as for other UNDP projects.
- The project sustainability is mixed. It is recommended that the PMO develop a detailed Action Plan for 2006 and 2007 to ensure the continued viability of China Green Lights.

Introduction

The China Green Lights project is a Chinese Government and UNDP/GEF joint initiative to improve the quality of Chinese efficient lighting products and to stimulate the demand for these lighting products both nationally and internationally. The project formally commenced in July of 2001, with full implementation beginning in September of 2001, and will be completed by December 2005.

As part of the original project design, a set of three evaluations were conducted: an independent evaluation after the first 18 months of project operation (Phase I), which was carried out by this Consultant; a Phase II evaluation after 36 months, carried out by the Evaluation Sub-Contractor (CECIC-Blue Sky); and a final evaluation after 45 months, carried out by this Consultant.

The primary purpose of this evaluation is to establish the degree to which the project has achieved its specified goals; to make recommendations for future actions; and to highlight any lessons to be learned.

The evaluation is organized into the following sections:

- Project Background and Context
- Findings: Log Frame Analysis and Milestones
- Review of Quantitative Evaluation
- Conclusions and Recommendations
- Sustainability Issues
- Annex A: Overview of Lessons Learned and Sustainability for Each Sub-Project
- Annex B: List of Meetings
- Annex C: References
- Annex D: Terms of Reference for Final Evaluation

Project Background and Context

The initial China Green Lights Project was initiated by the Government, with assistance from UNDP, in 1996. Following a start-up phase, and a formal evaluation by the United Nations Department of Economic and Social Affairs (UNDESA) in 1999, the State Economic and Trade Commission (SETC) began development of a project brief to submit to the GEF for expansion of the Green Lights Project. Following approval of the Project Brief by the GEF Council in 2000, the Project Document was prepared and was signed by SETC, UNDP, and the Chinese Ministry of Finance in July 2001. Implementation of the project began in September 2001.

The project aims to address identified market barriers to widespread use of energy-efficient lighting in China by broadening the China Green Lights start-up efforts. The overall objective of this project is to save energy and protect the environment by reducing lighting energy use in China in 2010 by 10% relative to a constant efficiency scenario. The specific objectives include upgrading of Chinese lighting products; increased consumer awareness of, and comfort with, efficient lighting products; and the establishment of a vibrant, self-sustaining market in efficient lighting products and services.

The project also has a secondary objective of expanding exports of high quality, high value efficient lighting products both to support the ongoing development of the Chinese economy and to lower costs of high quality lighting products in markets throughout the world.

Following a reorganization of Chinese Government Institutions, the project is being nationally executed by the Department of Environment and Resources Conservation of the National Development and Reform Commission (NDRC). NDRC has established a Project Management Office (PMO) for the project, overseen by the National Project Manager (NPM) under the National Project Director (NPD), both from NDRC. NDRC has also established a Project Steering Committee consisting of various stakeholders within China, including other government agencies and relevant industry and academic trade organizations.

OBJECTIVES OF THIS EVALUATION

The primary purpose of this evaluation is as follows:

> *"To conduct an overall evaluation of the China Green Lights project to establish the degree to which the project has achieved the specified goals, to make recommendations for future actions and to highlight any lessons to be learned"*

The specific objectives of the evaluation are to:

1. establish the extent to which the overall project goals (as identified in the original project document and inception report) have been achieved;
2. assess the viability of ongoing sustainability plans and make recommendations for amendments to these plans if appropriate; and
3. identify key lessons to be learned from the project that can be relayed to improve other projects currently being implemented of under preparation.

EVALUATION SCOPE

This evaluation adds to and complements other evaluation activities that have been carried out under the China Green Lights Project:

Project Implementation Reports (PIRs). These annual reports are prepared for UNDP and GEF annually in order to monitor project progress against the project's development and immediate objectives; and to highlight issues such as lessons learned, implementation issues, partnership strategies, and resources leveraged.

Monitoring and Evaluation. This ongoing function is carried out by the Evaluation Subcontractor, CECIC, with assistance from national and international experts. It consists of gather information for and preparing quarterly progress reports; working with the Survey Contractor to develop the project indicators and refine the annual survey design; preparing an annual project report for the Chinese government, and carrying out process evaluations to provide

Surveys. The surveys are carried out by the evaluation contractor, All China Market Research. The surveys are targeted at the domestic and non-domestic sector, dealers, and manufacturers. They will provide the basis for the ultimate impact evaluation for the project, as it will be possible to track information in impact indicators over time.

Formal Evaluations. The evaluations carried out after Phase I (18 months) and Phase II (36 months).

EVALUATION METHODOLOGY

This evaluation was partially desk-based and partially field-based. The consultant spent several days reviewing the original project and inception documentation, project outputs and the ongoing monitoring and evaluation material generated as part of the normal project activities. This was followed by a two-week trip to Beijing to interview key stakeholders and project participants during 22 August – 2 September 2005.

Since the time input in this evaluation was relatively limited, it has necessarily focused on a few key questions that could be substantively addressed in a short time frame:

- Has the project achieved its goals?
- Can the achievements be measured?
- What lessons can be learned and potentially transferred to programs in other countries?
- Has the UNDP input been vital to the success of the project?
- What sorts of resources and input are needed to sustain and upgrade the Green Lights activities in the future?

Documents Reviewed

The consultant reviewed a large number of documents related to the project design, as well as the reporting by the numerous sub-contractors. These documents are listed in Annex C.

Stakeholders Interviewed

The consultant conducted the following interviews:

- Natural Development and Reform Commission
- Project Management Office
- International Advisor
- Sub-contractors
  - Media Promotion
  - Certification and Labeling
  - Product EE Standards
  - Building EE Standards
  - Test Lab Consistency
  - Quality Commitment
  - Bulk Purchase (Media Aggregation)
  - DSM (Utility-Based Programs)
  - Survey Team
  - Evaluation Team
- Manufacturer association (CALI)Two manufacturers in Foshan, Guangdong

Findings: Log Frame Analysis and Milestones

The development objectives of the project are:

- to reduce lighting energy use in China in 2010 by 10% relative to a constant efficiency scenario; and
- to increase exports of efficient quality lighting products, aiding the Chinese economy and helping to reduce energy use and GHG emissions worldwide.

Given the long-term nature of these objectives, the original project document defined four immediate objectives with a number of associated outputs as a mechanism to measure overall project success. The four immediate aims are:

1. increase supply of high-quality lighting products
2. create demand for energy efficient lighting products by raising awareness and understanding among key categories of consumers
3. provide sustainable financing options for efficient lighting, and make quality lighting more affordable; and
4. evaluate and disseminate widely projects results achieved

It is the view of the evaluator that the outputs associated with the immediate objectives have been largely fulfilled. The review of the 15 major milestones set out for the project has established that all of:

- 7 milestones have been fully achieved; and
- 8 milestones have been exceeded;

In light of the complexity of the project and the large number of interdependencies among project elements, it is the view of the evaluator that fulfilling (or exceeding) all of the project milestones represents an outstanding achievement.

Details of the project outputs, indicators, and level of achievement are shown in Table 1 below.

Table 1. Log-Frame Analysis of Project Objectives and Outputs.

Immediate Objective	Outputs	Indicator	Observed Aug. 2005	Level of Achievement
Increase Supply of High Quality Lighting Products	1.1 Product efficiency standards established	Most of the energy efficiency standards are submitted to the State Bureau of Quality and Technology Supervision (SBQTS). Part of them are issued and implemented.	• 6 product standards approved by the Standardization Administration of China – Double-capped fluorescent tubes and CFLs (Sep. 2002); – High-pressure sodium lamps and ballasts (Nov. 2003) – Metal halide lamps and ballasts (Nov. 2004) – Improved procedures for standards analysis, consultant, and implementation – China Association of Standardization held 3 large-scale standard promotion and educational conferences around country (April 2003, November 2004, and April 2005) – Economic benefits estimated at 102 billion kWh and 49.9 billion RMB over 10 years – Environmental benefits 97.3 million tones of CO_2 and 5.4 million tones of SO_2	√+
	1.2 Building lighting design efficiency standards established	Most of the energy efficiency lighting standards for buildings are submitted to the Standardization Department of the Ministry of Construction (MOC). Several of them are issued and implemented.	• "Energy Standard for Lighting of Buildings" published by Ministry of Construction on 18 June 2004, and effective on 1 December 2004. • 6 mandatory standards approved for buildings. • 1 voluntary standard approved for residential buildings. • 1 standard for street lighting under consideration and likely to be mandatory. • 40,000 copies of standards distributed and 10,000 engineers and officials trained in details and implementation of new standards. (not UNDP funding)	√+

Immediate Objective	Outputs	Indicator	Observed Aug. 2005	Level of Achievement
	1.3 Consistency between test laboratories improve	The national testing centers pass the bench-marking inspection implemented by the China Academy of Metrology. Comparative test results show significant improvement in consistency among laboratories.	• 2 national round-robins led to improvements and adjustments in equipment and procedures. Improved testing consistency. • After equipment upgrades, NLTC can test more parameters and get more accurate results (meet international standard levels). • 2 international round robins: one with Japan and one with U.S. Passed both and met standard commercial levels. • Participated in U.S. round-robin testing with 11 U.S. labs through NVLAP program and passed (non-UNDP-funded) • Providing training and guidance to manufacturers as well as provincial and local testing laboratories.	√+
	1.4 Quality of key lighting products, as well as raw materials and components improved	Technical retrofit plans for one glass tube factory, one phosphor factory, one electronic ballast factory are developed and implemented by the manufacturers.	NDRC in Zhejian Province made loans in 2003 to De Bang Electronic Co. Production line upgraded, resulting in high-quality CFL products.	√
Create demand for energy efficient lighting products by raising awareness and understanding among key categories of consumers	2.1 Media Promotion Plan developed and implemented	Media Promotion Plan developed. Media programs on Green Lights are broadcasted on TV. Press releases issued and press conferences held. Several consumer promotion activities held. Green Lights Web-page established and site visitors counted. Awareness about quality Green Lights products raised significantly (as evidenced by surveys).	• Developed 6-part TV series on CCTV-10, and distributed 300 CDs • Developing 4-5 part TV series with State Bureau of Radio, TV, and Film • Developed teaching program on home decoration TV shows • Published papers on Green Lights in 8 domestic and international magazines • Developed regular columns in Consumer Daily • Cooperated with Global Village and provided information and awareness training on Green Lights to 6 primary schools and 5 communities • Unable to convince manufacturers to co-finance mass media promotion activities; however, some companies co-financed TV show	√

<table>
<tr><th>Immediate Objective</th><th>Outputs</th><th>Indicator</th><th>Observed Aug. 2005</th><th>Level of Achievement</th></tr>
<tr><td></td><td>2.2 Knowledge on Green Lights increased among public and professionals through training and preparation of publications and promotional materials</td><td>Educational material and case studies published and disseminated. Training sessions for professionals and large end users held. Evaluation finds that materials and training influenced decisions by those who received them.</td><td>• 7 books and many brochures
• 30 training courses for professional lighting designers; 15 training course for large end users
• Scores of seminars, workshops, and training activities held for each of the subcontract activities
• Three large national lighting conferences (including Green Lights and Green Olympics in 2002) and two international conferences (2004 International Green Lights Symposium and Right Light 6 in May 2005).</td><td>√</td></tr>
<tr><td></td><td>2.3 Certification and endorsement label of Energy Conservation Products established and implemented</td><td>Key lighting products pass the certification implemented by China Energy Conservation Product Certification Center. A substantial number of manufacturers participate in labeling program for covered lighting products.</td><td>• 400 products certified from 46 firms for 8 lighting product types
<table><tr><th>Date</th><th>No. Firms</th><th>No. Products</th><th>No. Lamp Types</th></tr><tr><td>Sep. 2003</td><td>7</td><td></td><td>3</td></tr><tr><td>Sep. 2004</td><td>24</td><td>400</td><td>4</td></tr><tr><td>Sep. 2005</td><td>46</td><td>600</td><td>8</td></tr></table>• Improved certification procedures and developed Quality Manual
• Developed QC system and certified CECP under ISO 65 (labeling body). Certified every year by AQSIQ
• Developed international outreach project to manage and promote the ELI certification Label and brand
• Certification label is not widely used due to market barriers and limited promotional budget</td><td>√+</td></tr>
</table>

Immediate Objective	Outputs	Indicator	Observed Aug. 2005	Level of Achievement
	2.4 Quality Commitment Program expanded	At least 8 cities are participating in the Quality Commitment Program.	• Quality Commitment programs operating at lighting plazas in 8 cities • Very low failure rate of 0.3% • Sales increased by 50%, of which approx. 75% due to QC program • Additional sales due to program approximately 1.3 million CFLs during Nov. 2003 – Nov. 2004	√
Provide sustainable financing options for Efficient Lighting and make quality lighting more affordable	3.1 Market Aggregation Activities Designed and Piloted	Market aggregation activities successful and continuing in at least three cities.	• Bulk purchasing implemented with one management organization; 10 suppliers; and 9 bulk purchase implementing organizations. • Locations covered include 9 provinces. • 604,150 lamps purchased at installed at 65 bulk purchase locations • RMB 8.9 million invested, of which RMB 4.1 million by the customer and RMB 4.8 million GEF subsidy. • Annual savings of RMB 27.5 million, with payback time of 3.1 months (1.8 months with subsidy); and 39.4 million kWh • Lifetime savings of 39.4 million kWh; 38,700 tonnes of coal; and 97,000 tonnes of CO_2.	√+
	3.2 Utility Based Programs designed and piloted	2 DSM pilot projects implemented and at least one utility is likely to offer lighting programs in the future.	• DSM pilot programs successfully implemented in 2 locations, and 682,700 lamps and ballasts installed • Energy benefits: estimated at 118 million kWh (lifetime) and 14.4 MW (peak) • Cost of saved energy was RMB 0.037.kWh compared to RMB 0.676 avoided electricity production costs and RMB 0.031/kWh incentive costs • Environmental benefits: avoided 35,600 tons of CO_2 emissions 58,100 tonnes of coal, 1,126 tonnes SO_2, and 948 tonnes NO_x	√+

Immediate Objective	Outputs	Indicator	Observed Aug. 2005	Level of Achievement
	3.3 Energy Management Companies (EMCs) financing of lighting projects promoted	At least four EMCs and/or lighting manufacturers offering on-going lighting efficiency financing services.	• Organized three seminars for EMCs on energy performance contracting and Green Lights • 6 EMCOs offering services compared to target of 4. Together, the 6 EMCOs expect to complete approximately 10 projects per year. • EMCOs jointly promoting energy performance contracting (EPC) model for lighting • Investment of RMB 8,920,00 and annual savings of 16.7 million kWh/year based on initial 8 projects. • Projects in Shanghai and Beijing respectively have received funding of RMB2 million and RMB 8 million through World Bank project financing channels. successfully.	√+
Evaluate and disseminate widely projects results achieved	4.1 Project Implementation structure in place	Project activities largely completed and reasonably on schedule. In-depth reviews satisfactory.	• Regular quarterly and annual reporting • PMO seen as highly competent and professional • All project activities completed on time	√+

Immediate Objective	Outputs	Indicator	Observed Aug. 2005	Level of Achievement
	4.2 Project experiences and lessons learned disseminated	Four to six newsletters on project experiences and lessons published each year. Reporting completed in a timely manner. Annual Green Lights conferences organized and successful. Evaluations show that many agencies, organizations and businesses plan to continue activities related to green lighting after program ends.	• Chinese and English web site developed • More than 60 Chinese newsletters and 2 English newsletters over project period both in paper and on Internet through the NDRC web site. • Annual conferences organized • Evaluations not carried out to assess or indicate future plans by agencies and firms to implement Green Lights after the project period; but Green Lights is one of 10 key EE projects in China's 5-Year Plan	√
	4.3 Progress monitored on regular basis	The surveys and evaluations are completed as scheduled and are of good quality.	• Surveys and evaluation reports completed • Quarterly progress reports are useful for program management • Initial problems and disagreement over survey indicators limited usefulness of tracking data • Because of these initial problems, and changes made in surveys after 2002, data for only 3 of the 4 years can be used for tracking trends in lighting market, lighting energy use, and consumer awareness	√
	4.4 Strategy for sustaining key project activities developed	The sustainable strategy plan will be submitted to final TPR meeting for approval.	• Strategy developed and submitted to NDRC, but it lacks a concrete Action Plan for 2006 and 2007. Green Lights one of 10 Key EE projects in the Five-Year Plan and in the China Medium and Long-Term Energy Conservation Plan	√

Review of Quantitative Evaluation

Background of Review

Our terms of reference directed us to determine the extent to which the project has achieved its objectives and targets. Obviously, one of the most important ultimate objectives are the project impact – lighting electricity savings in terms of kWh, percent reduction, increases in market share of high-efficiency lighting products, etc. Given the limited time available for this evaluation (4 weeks total), we were not able to conduct a rigorous review of the quantitative evaluation methodology and data; however, we attempted to review, summarize, and comment on the quantitative evaluation, in order to put the overall project results in perspective.

The Evaluation sub-consultant relied on input from the Survey sub-consultant as input for the quantitative evaluation. The Evaluation sub-consultant used several methods to assess the impact of the Green Lights Project. The main findings can be summarized as follows:

- electricity savings estimated at 15.78 billion cumulative kWh through the end of 2004 (equivalent to US$986 million savings in electricity costs to the consumer);
- reduction of 4.9% in lighting electricity use for 2003;
- cumulative reduction of 6.8 million tonnes of CO_2 as carbon (C);
- no observable change in proportion of sales by manufacturers categorized as "high-efficiency manufacturers." since project initiation;
- increase in share of automated lighting production lines from 2001 to 2003;
- increase in the ratio of high-efficiency products compared to low-efficiency products.
- average lifetimes of some high-efficiency lamps increased;
- average lifetime of electronic ballasts doubled, from 8,000 to 15,000 hours;
- output and exports of high-efficiency lamps increased substantially (approx. 40%) from 2002 to 2003, but there was no baseline established for comparison;
- aggregated, overall awareness of high-efficiency lighting products increased; and
- the share of high-efficiency lighting products increased from 32.1% in 2002 to 34.7% in 2003.

Below, we briefly review and comment on the results.

Method 1.1. Amount of Lighting Electricity Conservation

Method	Result (end of 2003)
Amount of Lighting Electricity Conservation	15.78 billion kWh (cumulative)

The formula is long and has a number of steps. It depends on developing representative lifetimes; usages periods; power draw; and power draw of lamps replaced. It also requires an estimate of what would be the annual accrual rate of high-efficiency lighting products, which is presumably the baseline against which additional savings from energy-saving lamps are calculated. This baseline is a very important figure, and there is no description of how it was arrived at, other than a reference to a figure of 8% provided by the international expert Adam

Hinge. Given its central role in the calculation, this number should be more fully and carefully referenced.

Recommendation: PMO Should Commission a Report Documenting of the Lighting Energy Baseline
The impact evaluation is based on calculations that assume a "natural rate" for annual increase in sales of energy-efficient lighting products of 8%. However, this figure is not properly document, and for example, sales of CFLs for the period 1995 to 2000 were in the range of 25-50% per year. It is essential to develop a properly documented baseline for estimating future savings from the lighting energy-efficiency programs.

Method 1.2. Ratio of Lighting Calculation

Method	**Result**	
Ratio of Lighting Calculation	1.5% of 2002 lighting energy use	4.9% of 2003 lighting energy use

This calculation is expressed as ratio of lighting energy savings in a year divided by the total, estimated lighting energy use for that year. The estimates of lighting energy savings are based on the figures derived in Method 1.1 (kWh). The estimates of total lighting energy use are derived by multiplying the total electricity use by 12%, which is assumed to be lighting's share of total national electricity consumption. This figure is not referenced, and there is no explanation as to how it is derived.

It appears that using a constant share of lighting energy use as 12% of total electricity consumption introduces inaccuracy into the calculation.

Method 2. Amount of Reduced Emissions of CO_2

Method	**Result**
Amount of Reduced Emissions of CO_2	6.8 million tons of C (cumulative)

The kWh input from this calculation is the cumulative kWh savings estimated in Method 1.1. All other variables are related to the system losses and the CO_2 emissions factor for coal, etc.

It appears from reviewing the calculation that the CO_2 emissions may be slightly overstated; the equation shows the emissions factor for coal, but this emissions factor should be should be weighted, along with emissions factors for other fuels used in power generation.

Method 3.1 Degree of Industrial Centralization

Method	Result
Degree of Industrial Centralization	No observable change in proportion of high-efficiency lighting products since project initiation

This method tracks the increase in the proportion of sales from manufacturers that are deemed to be "high-efficiency manufacturers", relative to the total sales of the lighting industry.

This method is somewhat exact since it makes assumptions about which are the top 10 producers of high-efficiency equipment in each year. One would not necessarily expect to see an impact over a two-year period. A longer time trend might reveal a clearer result.

Method 3.2 Level of Technological Facilities

Method	Result
Level of Technological Facilities	Increase in share of automated lines from 2001 to 2003. Decrease in share of half-automated lines from 2002 to 2003. Slight decrease in share of manual lines from 2002 to 2003.

This method tracks the share of production automation, by classifying production into three types: manual production; half-automated production; and fully automated production. The result shows that the share of automated lines has increased; and the share of half-automated and manual lines slightly decreased from 2002 to 2003.

Method 3.3 Product Mix

Method	Result
Product Mix	The aggregated product mix increased from 0.21 to 0.36 from 2001 to 2003.

This method tracks the ratio of high-efficiency products to low-efficiency products. The final aggregate figure of 0.36 apparently means that there are approximately 3 times as many low-efficiency products, compared to high-efficiency products in the market. However, this is better than at the beginning of the project, when there were approximately four times as many low-efficiency products, compared to high-efficiency products in the market.

The detailed calculations (i.e. absolute production of high-efficiency and low-efficiency models in each year) are not shown in the report, and it would be interesting to have access to these numbers.

Method 3.4 Product Quality

Method	Result
Product Quality	Average lifetime of some high-efficiency lamps increased. Average lifetime of electronic ballasts doubled.

This method tracks the lifetime of high-efficiency lighting products. The evaluation claims that the "life and quality of high-efficient lighting products have increased to a certain degree." In fact the trends from 2001 to 2003 are mixed:

- lifetime of T5 lamps increased;
- lifetime of T8 lamps decreased;
- lifetime of CFLs decreased from 2001 to 2002 and then increased in 2003;
- lifetime of single-end fluorescents increased;
- lifetime of high-pressure sodium lamps increased;
- lifetime of metal halides decreased from 2001 to 2002 and then increased in 2003; and
- lifetime of electronic ballasts doubled from 8,000 hours to more than 15,000 hours.

Method 4.1 Output and Export Volumes of High-Efficiency Lighting Products

Method	Result
Output and Export Volumes of High-Efficiency Lighting Products	Output increased 13% from 2001 to 2002 and 46% from 2002 to 2003. Exports increased 4% from 2001 to 2002 and 40% from 2002 to 2003.

The comparisons for 2002 to 2003 may also not be valid, since the 2001 and 2002 data are estimated by CALI and experts and the 2003 data are based on the ACMR annual survey report for 2004.

Method 5 Sustainability of Development of High-Efficiency Products and Services

Method	Result
Sustainability of Development of High-Efficiency Products and Services	Sustainability index increased from 62.5 in 2001 to 70.4 in 2003

An overall index was developed by experts and it includes a number of components: enterprise's competitive edge (weight = 35%); consumer confidence (20%); state supporting policies (15%); fair market environment (15%); and sustainable service ability of agent (15%).

Overall, the index number itself does not have much meaning, since it is clearly subjective and not an exact measure. However it is interesting to note that the indices with the highest ratings (~70-80%) are related to the companies and the testing/certification process. The lowest ratings are for "fair market environment" – in the range of 40-50%. This has to do with quality guarantee and reasonable price.

Method 8.1 Awareness Ratio of High-Efficiency Lighting Products

Method	Result
Awareness Ratio of High-Efficiency Lighting Products	Aggregated overall awareness of high-efficiency lighting products increased from 59% to 66% from 2001 to 2003.

Among family users, awareness of CFLs increased from 83% to 89%; and awareness of thin-tune fluorescent lamps increased from 59% to 78%.

The report does not explain how the aggregate index mentioned in the table above is calculated.

Method 9 Percentage Use of High-Efficiency Lighting Products

Method	Result
Awareness Ratio of High-Efficiency Lighting Products	The share of EE lighting products increased from 32.1% in 2002 to 34.7% in 2003.

This measure tracks the percent of users (both family and non-domestic bulk users) using different lamp types. The share of EE lighting products as a percentage of total lighting products increased slightly, from 32.1% in 2002 to 34.7% in 2003.

Conclusion	Recommendations
1. Project Design is Effective and Well Integrated	NA
2. The PMO is Well Managed and Should Not Close Down	**Maintain a Transitional PMO.** As a high priority recommend, we urge the Chinese government to allocate adequate funding for a transitional PMO starting on 1 January 2006.
3. UNDP Has Played a Critical Role in Improving Lighting Efficiency	**Separate "Old" from "New" Green Lights Elements.** We see a risk of continued UNDP/GEF support of the Old Elements. If the Chinese government continues to rely on outside funding for these core processes of the Green Lights Project, this may delay the transition to Chinese ownership and support.
	Build on momentum of Right Light 6: improve English web site and international coordination and outreach. Given the importance of China's links to the global lighting community, it is vital for the China Green Lights Program to improve its English web site and international coordination and outreach.
4. Manufacturers are not using the CECP endorsement logo on their CFLs	**Streamline process of testing and compliance for CFLs.** The recommended solution was "One-Stop Compliance" for manufacturers: testing of the CFL in order to satisfy the MEPS requirement and also qualify for certification.
	Develop Labeling and Awareness Task Force. The Task Force would develop an integrated labeling strategy for EE lighting. It would make recommendations on an integrated label that would facilitate testing, certification, and identification of the efficiency and quality of all lighting products.
5. Survey and Evaluation Functions Should be Combined	**Combine survey and evaluation functions in Green Lights III Project.** The survey and evaluation functions should be integrated into a single team that possesses skills and experience in market research, as well as process and impact evaluation techniques.
	Decide on long-term tracking surveys. It is important for the PMO to review the current survey questionnaires and indices, and to make recommendations on the content of long-term tracking surveys.
6. CICETE played a critical role by improving the efficiency of project administration	**Promote the CICETE model to other countries and aid agencies.** UNDP should develop a strategy for promoting the CICETE model to other countries and agencies that are implementing development projects. UNDP could write a case study of the role of CICETE as the administrative agency on China Green Lights Program.

7. Lack of Concrete Action Plan for Continuation of the Pilot Programs	**Develop a short-term and long-term strategy for continuation of the pilot programs.** The short-term strategy should outline how to continue the bulk purchase and quality commitment programs through a management fee that would be requested from the Chinese government. A longer-term strategy will also need to be developed to include the DSM programs.

Conclusions and Recommendations

CONCLUSION 1: PROJECT DESIGN IS EFFECTIVE AND WELL INTEGRATED

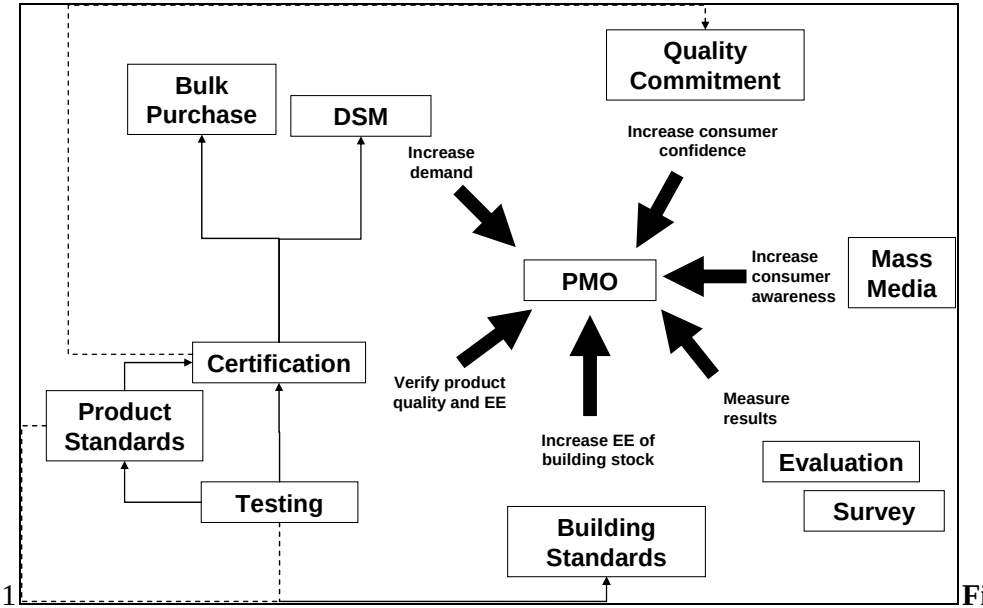


Figure 1 **Figure 1. Schematic View of Project Elements in Green Light Project.**

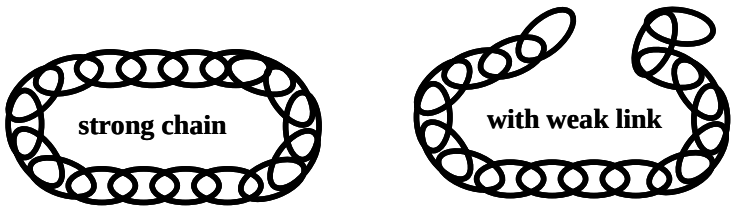
The following overall observations can be made based on interviews with the sub-consultants and manufacturers:

- The testing, product standards, and certification acted as the pillar upon which the pilot programs (bulk purchase, DSM, and quality commitment) were based.

- 6 product standards were developed and approved, for double-capped fluorescent tubes; CFLs; high-pressure sodium lamps and ballasts; and metal halide lamps and ballasts.
- More than 600 lighting products were certified from 46 firms for 8 different lighting product types.
- The pilot programs – especially the bulk purchase and DSM – were largely effective and met their goals. In a strategic sense, it is important to note that *they served as drivers for manufacturers to get their products certified.*
- The Quality Commitment Program, although limited in scale, has demonstrated the viability of using certification as the basis for providing a retailer guarantee that will increase consumer confidence.
- Standards for lighting power density were developed for 7 types of buildings and street lighting for the first time. The Chinese government has already used its own money to train 10,000 engineers and designers on the technical aspects and implementation of the new standards..
- The survey produced much valuable data as input to the evaluation; however, the lack of clearly detailed TOR for the quantitative indicators, and the decision to separate the survey and evaluation sub-consultants, limited the effectiveness of these project elements.
- The mass media sub-consultant was very active, and produced a number of articles, trained journalists, provided supporting materials to schools and villages, and assisted in preparation of TV shows. However, compared to the other elements, the mass media was somewhat of a disappointment. There was broad agreement among those interviewed for this evaluation that the mass media activity lacked an adequate budget and resources to be able to make an impact on consumer awareness.
- The quantitative evaluation shows a significant impact of the Green Lights Project in terms of electricity savings; percent reduction in lighting electricity consumption; and a number of other market measures.

Lesson Learned

The most effective project design relies on multiple partners playing their roles, and supporting each other toward an overall goal. However, this type of project design carries risks (since more things can go wrong.



The project design is only as strong as its weakest link.

CONCLUSION 2: THE PMO IS WELL MANAGED AND SHOULD NOT CLOSE DOWN

The Project Management Office (PMO) received universal praise and support from the sub-consultants interviewed. The only significant recommendations for improvements were in the area of information flow and data availability: some felt that there should be more transparent and easy access to data across the projects. For example, the survey data, evaluation results, test data, and data from CALI on market estimates.

Many of the sub-consultants felt that possible shut-down of the PMO at the end of 2005 would be a threat to the continuity of the overall Green Lights efforts. As Figure 1 shows, the PMO acts as the "spider" in the middle of the web of Green Lights activities. Without the coordinating center, the various project actors (i.e. sub-consultants managing the different project elements) will not get regular and clear information from the other actors; and the coordination and linkages that make the project strong will begin to fade. A long delay without a PMO could have serious impacts on the longer term viability of China Green Lights, as the delay would cause the private sector to lose interest and confidence in the program.

Lesson Learned

For an effective PMO, it is important to have a central organization, with stable staffing, and dedicated to the PMO function (i.e. not distracted by other job responsibilities).

Urgent Recommendation: Maintain a Transitional PMO

As a high priority recommendation, we urge the Chinese government to allocate adequate funding for a transitional PMO starting on 1 January 2006. In order to maintain focus and efficiency for Green Lights, it is important for that the PMO team remain independent and not become subsumed within another organization.

CONCLUSION 3: UNDP HAS PLAYED A CRITICAL ROLE IN IMPROVING LIGHTING EFFICIENCY

Interviews with the sub-consultants led to the clear impression that the UNDP/GEF assistance was essential to achieving the impressive results of the last four years. In other words, the primary project results – improved testing capacity, development of standards and certification levels, implementation of pilot programs, detailed quantitative estimates of impact – *would not have occurred* during this time period without the UNDP/GEF assistance.

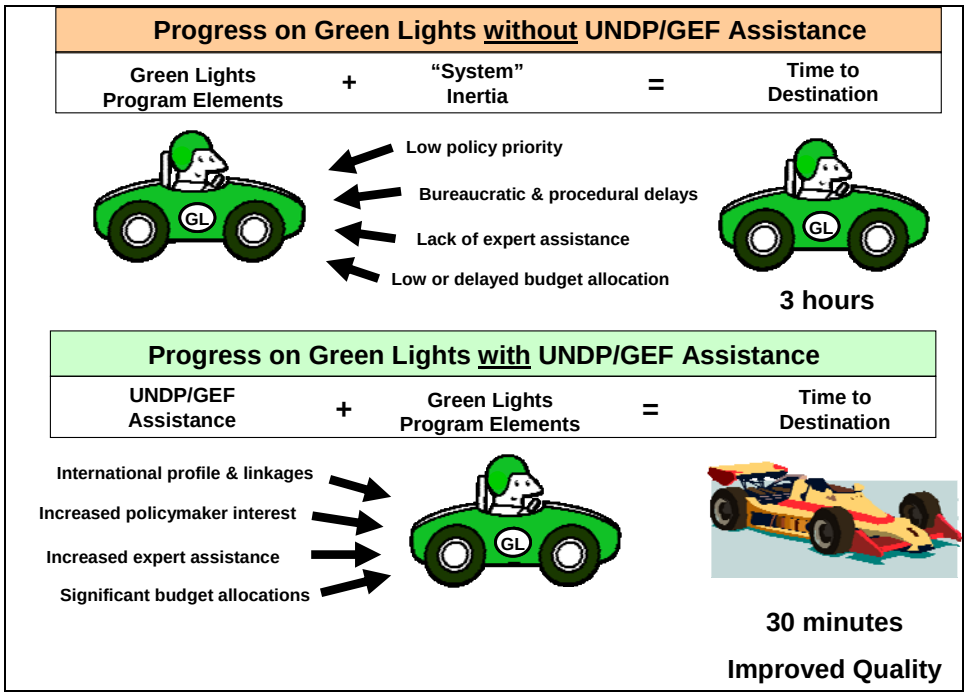


Figure 2. Schematic Showing Examples of How UNDP/GEF Assistance Expedites Program Results

Figure 2 shows a "mental model" we have developed to describe the impact of UNDP/GEF funding:

- *Without* the outside funding: progress would have occurred but quite slowly. Some examples of this include the lack of previous government approval of budgets to update the building lighting standards; and the statement by the certification sub-contractor that certification schemes were developed for approximately four times as many product types due to the outside assistance.
- *With* the outside funding, results are achieved more quickly and also at a higher level. To support this observation, we refer to the comments of the building standards sub-contractor, who indicated that the national survey of actual lighting conditions and practice, made it possible to justify a more aggressive standard. Similar comments were made by the product standards sub-contractor: that the UNDP/GEF supported more in-depth benefit cost analysis and therefore resulted in a higher level of efficiency in the MEPS..

While it would be tempting to conclude that the budgetary resources alone were the primary factor, this does not appear to be the case. The budget inputs, and related national and international technical assistance, was significant; however, the international "brand" of UNDP appears to play an important role in increasing program credibility and recruiting domestic participants, as well as facilitating linkages with international agencies and firms. Below are some of the comments recorded during our interviews with the sub-consultants:

Table 2. Selected Comments from Sub-consultants on Role of UNDP/GEF Assistance

Sub-consultant	Comment
Testing Lab Consistency	"It was not just the money. UNDP provide an essential platform for cooperation with international institutions and experts. The UNDP brand gives the project credibility and attracts international cooperation, as well as manufacturer participation."
Certification	"Without UNDP, maybe only 2 lighting products types certified instead of 8"
Quality Commitment	"International support increases the credibility of the Green Lights brand"
DSM Pilot Project	"This has been the most successful DSM project in China."
	"The PMO plays an important coordinating role, and it is important for the PMO to exist to maintain continuity of the project"
EMC Pilot Project	"This project successfully involved several EMCOs in lighting efficiency projects. Once they have started, they can proceed, even without the Green Lights support."

As above comments in Table 2 indicate, UNDP/GEF funding, both directly to the project activities, as well as indirectly through the coordinating efforts of the PMO have been highly appreciated by the sub-consultants. This, however, begs the questions of how "necessary" were the UNDP/GEF inputs for the outcomes achieved.

This obvious success of the UNDP/GEF intervention leads the question of whether it is sustainable. This question actually has several sub-questions attached:

1. Will the UNDP/GEF-supported activities continue by themselves after the end of this project?
2. Have the institutions developed capacities to design, implement, and monitor that can be carried forward to effectively improve lighting efficiency in China?
3. Are there budgetary resources available from the Chinese government to support the activities (i.e. standards development, media promotion, management of bulk procurement or quality commitment programs) now that the UNDP/GEF funding is ending?
4. If the answer to 1 and 3 is no, then what level of UNDP/GEF support is needed, and for which activities?
5. What other multilateral/bilateral funding is available to support such activities for a continuation/expansion of the Green Lights Program?

Our recommendation as far as future UNDP/GEF support is concerned is to distinguish between "Old Elements" and "New Elements" and focus new international funding efforts and technical assistance on the New Elements.

Recommendation: Separate "Old" from "New" Green Lights Elements	
"Old" Elements	**"New" Elements**
• *PMO function. Core coordination and management functions of the PMO* • *Standards. Development of product and building standards* • *Certification. Development of certification levels and schemes for new lighting products* • *Incentives for existing programs. Rebates for existing pilot programs, such as DSM and bulk purchase (if needed)* • *Basic lighting testing. Improvements in quality of lighting testing*	• *Government procurement. Strategy and plan to implement government procurement of EE lighting* • *Enforcement. Planning, implementation, and training on effective market monitoring and compliance. Needed to ensure impact of MEPS and labeling.* • *Survey research and evaluation. Intensive capacity-building to improve integration of survey research into the monitoring & evaluation process.* • *Technology demonstration. State-of-the-art lighting technology demonstration and exchange program* • *Environmental criteria. Development of allow levels and testing for environmental parameters (i.e., mercury) for Green Lights* • *Materials recycling. Development and promotion of materials recycling*

The Old Elements are activities and processes that UNDP/GEF has already funded, and where Chinese actors have developed the capacity to successfully execute the activities. include the part of core part of the coming Green Lights Program. *Old elements that were proven successful should be funded by the Chinese government.*

The New Elements are activities and processes where China particularly needs input and value added from an outside funder or expert(s) in order to be able to "learn" a new skill or achieve a results. These elements are candidates for international support:

We see a risk of continued UNDP/GEF support of the Old Elements. If the Chinese government continues to rely on outside funding for these core processes of the Green Lights Project, this may delay the transition to Chinese ownership and support. For example, *given the massive energy savings identified from the MEPS, certification, bulk purchase, DSM, and quality commitment activities, it appears that these programs justify substantial state support. In addition,* ***this conclusion has been validated by the inclusion of in the China Medium and Long-Term Energy Conservation Plan****.*

Lesson Learned
Funding agencies should "embed" their funded activities in ongoing organizational roles and activities *For the most part, UNDP funded activities that were ongoing. UNDP funding helped things go "faster" and "more effectively." Activities that were not "embedded" in the role of the organization did not work as effectively (e.g., mass media).*

Recommendation: Build on momentum of Right Light 6: improve English web site and international coordination and outreach

The Right Light 6 Conference, held in Shanghai during May 2005, was a major success and attracted international participants from all over the world. Given the importance of China's links to the global lighting community, it is vital for the China Green Lights Program to build on the momentum of the Right Light Conference and improve its English web site and international coordination and outreach.

The Right Light 6 Conference highlighted the important role of China Green Lights, and greatly increased international awareness of the importance of the Chinese lighting industry and the substantial gains being made in product efficiency among Chinese manufacturers. In addition, the conference gave birth to a significant initiative: the International CFL Harmonization Initiative, which already has gained the support of more than 20 major private sector firms; government agencies; associations; and NGOs (www.apec-esis.org/cfl).

Given the importance of China's links to the global lighting community; the fact that approximately 60% of its lighting production is exported; and China's key role in ongoing initiatives such as the CFL Harmonization Initiative and the Efficient Lighting Initiative (which is led by CSC/CECP); it is vital for the China Green Lights Program to build on the momentum of the Right Light Conference and improve its English web site and international coordination and outreach. These international outreach and communication elements should not be neglected by the Chinese government, as they plan for the core project elements of the next phase of China Green Lights.

CONCLUSION 4: MANUFACTURERS ARE NOT USING THE CECP ENDORSEMENT LOGO ON THEIR CFLS

The most obvious market gap we identified is that most manufacturers are not using the CECP logo on their CFL products. One reason for this is that the consumer market forms a small percentage of sales for many of the manufacturers. Another is the perception among manufacturers that there is very low or no awareness of the CECP logo among purchasers. However, even given these barriers, the structure of the CFL market is also working against widespread adoption of the certification logo.

Table 3 shows a model of the CFL market dynamics based on our interviews with manufacturers and with several of the sub-consultants:

- International Brand CFLs. These manufacturers do not want to lose their "brand" advantage. If they put their weight behind the certification scheme, they may undermine their brand identification with quality; this may make it harder for them to get a premium on the sale of their CFLs.
- Top Domestic Brand CFLs. These manufacturers are caught in a bind: if they certify and display a logo on their products, they will likely not be able to get a premium for the CFLs since the certification logo is not widely known in the market. Therefore, they are often forced to sell higher-quality models OEM in order to get better price.
- Medium Domestic Brand CFLs. These manufacturers may have certified one or two of their models in order to participate in one of the pilot programs. However, they do not have an incentive to display the logo on their products since a consumer movement

toward certified CFLs would hurt sales of their lower price, lower-quality CFLs, which make up most of their sales.

Table 3. Model of Market Dynamics Discouraging Use of CECP Logo on CFLs.

Market Segment	Selling Point	Portion of CFL Products Certified	Incentive to Display CECP Logo
International Brand CFL	Brand name		Very low: since they would lose their brand distinction to Top Domestic Brands that certify
Top Domestic Brand CFL	Price, Brand		Low: if they certify, they cannot sell at higher price because certification is not widely known in market. Forced to sell higher-quality models OEM in order to get better price.
Medium Domestic CFL	Price		Low: if they certify, they will sell more of their certified models, but hurt sales of their non-certified models.
Poor Domestic CFL	Price		None: none of their products meet certification requirements.

In summary, the manufacturers we interviewed, as well as the sub-consultants, agreed that consumer awareness is of the certification logo is very low, and that this will not be remedied without a massive advertising and marketing effort. The consensus was that the supplier certification was being mainly driven by the desire of the suppliers to qualify for sales through the three pilot projects: DSM, bulk purchase, and quality commitment.

Recommendation: Streamline process of testing and compliance for CFLs.

Manufacturers indicated that the process of testing for MEPS, as well as certification for the CECP logo is complicated, time-consuming and expensive. During our discussions, it was recommended that the whole process be streamlined and simplified in order to reduce compliance costs and overhead. The recommended solution was "One-Stop Compliance" for manufacturers: testing of the CFL in order to satisfy the MEPS requirement and also qualify for certification.

One manufacturer suggested use of a single, comparative label (the current Chinese "Information Label"). Such an integrated comparative label would have two main advantages: first, it would show the relative efficiency of all lighting products (not just certified products); and at the same time, it would raise consumer awareness of energy-efficient lighting. Two examples of possible label models are shown in Figure 3 below.

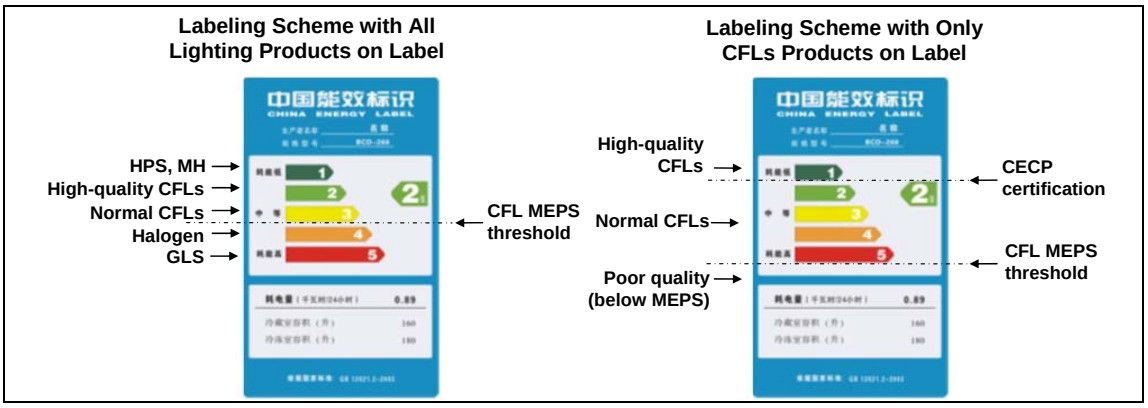


Figure 3. Example of an Integrated Comparative Label for Lighting Products. CFL manufacturers preferred the option at right, since it would incorporate the MEPS and endorsement levels and would highlight the difference between high-quality and lower-quality CFLs.

Recommendation: Develop Labeling and Awareness Task Force to develop integrated labeling strategy for EE lighting.

The PMO should coordinate establishment of a Labeling and Awareness Task Force that would bring together CNIS, CECP, manufacturers, and other stakeholders to design an integrated label that would facilitate testing, certification, and identification of the efficiency and quality of all lighting products. The format of the label would be decided based on the consultation; and it should be possible option to also "integrate" the endorsement label into the comparative label, as has been done in the energy labeling schemes in Australia and the United States.

CONCLUSION 5: SURVEY AND EVALUATION FUNCTIONS SHOULD BE COMBINED

We observed a number of problems with the survey and evaluation function. The main problem appears to be an inefficient management structure, with unnecessary institutional separation of the survey and evaluation functions.

This problem was exacerbated by the lack of a clear TOR for the survey function at the project inception. Our understanding is that the national experts advising the PMO could not reach common agreement on which data were correct; this made it difficult for survey and evaluation consultants. These initial problems and disagreement over survey indicators limited the usefulness of tracking data, since data for the first year could not be used.

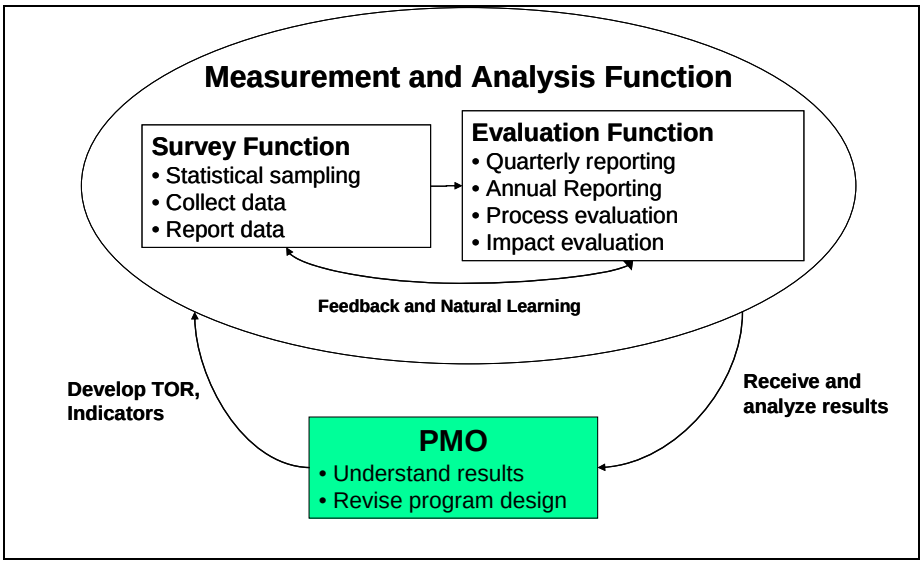


Figure 4. Schematic Showing Desired Integration of Measurement and Analysis Functions.

Overall, the comprehensive output data from survey and evaluation not as useful as hoped for tracking trends in lighting market, lighting energy use, and consumer awareness.

Recommendation: Combine Survey and Evaluation functions in Green Lights III Project

*The survey and evaluation functions should be integrated into a single team that possesses skills and experience in market research, as well as process and impact evaluation techniques. This will provide a clearer focal point for the evaluation function, as well as strong leadership for this important management and monitoring function (see **Figure 4**).*

The intensive surveys that have been carried out since 2002 have provided a valuable source of data to understand changes in the lighting market, customer end uses, and consumer awareness. Given the problems that occurred with the 2002 data due to lack of agreement on detailed survey indicators, it is absolutely essential that the PMO lead a process to review the current survey questionnaires and indices, and make recommendations on the content of long-term tracking surveys.

Recommendation: Review the current survey questionnaires and indices, and decide on long-term tracking surveys.

The PMO will also need to justify continued government support for the survey and evaluation function. If this function is lost, or delayed for even a year, it will make it much harder to understand and measure the benefits of the China Green Lights Program. And without the ability to understand and measure the benefits, the current strong national and international support for the program may be harder to maintain in the future.

CONCLUSION 6: CICETE PLAYED A CRITICAL ROLE BY IMPROVING THE EFFICIENCY OF PROJECT ADMINISTRATION

CICETE (the China International Center for Economic and Technical Exchanges) was established in 1980. It is the Chinese government counterpart on core UNDP projects (see **Error! Reference source not found.**). CICETE has implemented more than 700 UNDP projects since its establishment.

On UNDP-GEF projects, the Ministry of Finance is the counterpart, NDRC is the Implementing Agency, and CICETE provides services to NDRC. For this China Green Lights Project, the CICETE fee for its services is 3$ of the total budget of USD 8.1 million. This 3% is a standard fee.

Table 4. CICETE Role on Development Projects

Project Type	CICETE Role	Comments
UNDP core resources	executing agency	CICETE designated by UNDP as executing agency for its core resources
GEF projects	service provider	UNDP is executing agency on behalf of UNDP NDRC is implementing agency on behalf of UNDP MOF is counterpart CICETE provides services to NDRC
Other international aid (ODA) projects	service provider	CICETE has to submit proposals to get contract from aid agency

With CICETE handling the project logistics, especially bidding and contracting, this allowed the PMO to focus on project implementation and strategy. CICETE provides the following services:

- Personnel. Recruitment and contracting for national and international personnel. CICETE receives a detailed TOR from the PMO, contacts the expert, and negotiates a contract.
- Subcontracts. CICETE publishes bidding announcement on the web and newspaper; is responsible for the bidding process; recruits independent experts recommended by the PMO for the evaluation committee; and negotiates and contract with bidders.
- Equipment. CICETE manages the bidding process. For consultant and equipment contracts of less than USD 30,000, CICETE can choose among several options without an open tender. For contracts between USD 30,000 and USD 100,000, CICETE must submit an invitation to bid to at least three firms and have an independent evaluation process.

Lesson Learned
Having an administrative agency handle the administrative and procurement aspects of a project can make the implementation much more efficient. Otherwise, the project staff spend time on procurement and administrative activities where they do not have well developed skills, and this takes away from the effectiveness of project implementation.

CONCLUSION 7: LACK OF CONCRETE ACTION PLAN FOR CONTINUATION OF THE PILOT PROGRAMS

There is no doubt that the DSM and bulk purchase pilot programs were highly successful in strategy and execution. However, the current model relies heavily on a rebate, which is not sustainable at present, as there are no general mechanisms from Chinese sources that can continue to fund rebates for the purchase of EE lighting equipment. In addition, the rebate in the bulk purchase program was based on relative prices during the project design several years earlier, and was clearly too high – accounting for more than 50% of the cost of lamps. The result was that for the bulk purchase program, the customer payback time was 1.8 months after the rebate/subsidy.

Rebates may be necessary for a period of time to continue to drive the market transformation impacts of the Green Lights Program. However, the rebates should be scaled back and actively managed. And during Green Lights III, the rebates should be "blended" funding to demonstrate a commitment by the Chinese government to the concept of rebates, and to reduce the program's dependence on foreign funds for incentives.

Bulk purchase program. The sub-consultant agreed that it is possible that the bulk purchase program, which achieved reductions of approximately 15% in the CFL purchase price, can proceed without the rebate. However, in order for the program to operate, there is a need -- at a minimum -- for budget support for a commercial organization to manage the project. The sub-contractor suggested in-depth research on strategies for developing the bulk purchase program into a self-perpetuating activity (i.e. making it sustainable).

DSM programs. In contrast to the bulk purchase program, DSM programs can provide subsidies for CFLs, since some utilities have access to a funding mechanism (their customer tariffs). However, the DSM rebate in Hebei, based on the system benefit charge (SBC) supported only a quarter of the rebate (UNDP/GEF provided the rest). And the development of SBCs will not take time and is not likely to spread quickly

Quality commitment program. This program is on a modest scale, with pilot centers set up in 8 cities. Nonetheless, it appears to be working well and has led to an increase of approximately 1.3 million CFL sales during the past year, based on records from participating stores. The question with this program is similar that that for the bulk purchase program: who will support the cost of the project management unit? With that cost supported, the program can likely proceed and be effective. This activity could be a good potential candidate for the "Building a Saving Society Program", since it is consistent with the program principles and can be implemented at a local level.

The Sustainability Strategy (CECIC 2005) does not appear to lay out a strategy for funding continuation of the pilot programs. There is an indication that funding an ongoing subsidy of USD 0.40 per lamp will be provided and that funding will be sought from international sources as well as from central and local governments. It also calls for an initial management fee of USD 400,000, and does not appear to specify whether this amount will be requested from international sources or from the Chinese government.

Recommendation: Develop a short-term and long-term strategy for continuation of the pilot programs

The short-term strategy should outline how to continue the bulk purchase and quality commitment programs through a management fee that would be requested from the Chinese government. The request would need to justify the programs based on the proven increase in sales (and related energy savings) to date, and the argument that these programs can proceed, and succeed, without a subsidy. A longer-term strategy will also need to be developed to include the DSM programs. This strategy would identify which utilities may want to participate; the extent to which SBC funds are available; how the programs should be targeted (e.g., toward the rural poor). The longer term strategy would also need to specify the role of the bulk purchase and quality commitment programs and answer questions such as: Who will fund these programs on an ongoing basis? Should the bulk purchase concept be merged with the DSM programs?

Sustainability Issues

An important objective of this evaluation was to assess the viability and ongoing sustainability of the program and its sub-components.

It appears that implementation of activities during the project period was quite successful, for two main reasons:

- The project was designed to build on and enhance the capabilities of existing agencies, and to complement their work streams. In this regard, the project has succeeded, and the human resource infrastructure remains to carry on the work into the next phase, Green Lights III.
- Another, complementary, reason is the high level of importance the government has signaled for Green Lights, by naming it one of the 10 key energy efficiency projects in China's Medium and Long-Term Energy Conservation Plan (NDRC 2005).

Despite the above, however, there are a number of questions related to sustainability that are raised by the end of the UNDP funding. These questions mainly stem from the fact that there is a lack of a clear Action Plan for moving forward. While there was a "Sustainability Strategy" developed as part of this project, it serves primarily to describe areas for potential funding, and does not differentiate which project areas are more critical, or which project areas can be funded domestically and which should be prioritized for funding by international agencies. In addition, there is no clear plan of action for 2006.

The result of this is that there is a lack of clarity about what happens next. Nearly all of the project pieces, elements, and human infrastructure remain in place, but there is no clear idea of what will happen starting in January 2006.

In assessing the sustainability of the project, we asked the following question:

How likely is it that the Green Lights sub-projects will continue on their own and succeed in achieving objectives?

In attempting to answer this question for each sub-project, we developed a simple ranking scheme:

- **High:** very likely to continue and resources in place
- **Medium:** model is viable, but funding or resources may not be in place
- **Low:** model is not viable or needs changing; and/or resources not in place

The results of this ranking are shown in Table 5. Please note that the index is simply to facilitate an assessment of future sustainability and is NOT a rating of the sub-contractor. Instead, it is a rating of the project design and viability going forward, including availability of budget and resources for continuation.

The following conclusions can be made based on the assessment:

- While nearly all of the projects performed well during the UNDP-GEF-funded Green Lights Project, one of the main barriers going forward is budget support.
- While the Chinese government has named China Green Lights one of the top 10 energy-efficiency projects in its Medium and Long-Term Energy Conservation Plan,

there is, as yet, no detailed Action Plan and budget for the continuation of China Green Lights.

- We assessed two of the projects to be "high" on the sustainability index. These were Certification Labeling and the Energy Management Companies. Both of these companies have a clear business plan and revenue stream.
- We assessed the three pilot programs (Quality Commitment, Bulk Purchase, and DSM) to be "medium" on the sustainability index. While these activities appear to be viable, the main barrier is a the lack of a business plan and budget commitments for 2006 and beyond.
- We assessed 4 of the projects to be "low" on the sustainability index:
  - Product and Building EE Standards do not currently have a budget allocation from the government to develop further, high-quality standards for energy-efficiency of additional building types and lighting products.
  - There is no budget allocation or government plan to continue the promotional efforts to support China Green Lights.
  - There is no budget allocation or government plan to continue the survey and evaluation activities to support China Green Lights.

Lesson Learned
The assessment of sustainability indicates that the "sustainability component" of the project should have started in the beginning of the project, rather than half-way through. In addition, the sustainability strategy may have benefited from more active involvement by UNDP. Since the key issue revolves around UNDP-GEF principles for funding possible follow-on work, as well as UNDP-GEF's expectations about sustainable activities, the project would have benefited from a more direct and consistent ongoing dialogue between UNDP-GEF and NDRC about each parties expectations for, and interests in, Green Lights III.

Table 5. Assessment of Sustainability for Each Sub-Project (see Annex A for more detail)

Sub-Project	Assessment of Sustainability	Sustainability Index
Output 1.1: Product EE Standards	Currently not sustainable without outside funding for market research, analysis, and other aspects of standards development.	Low
Output 1.2: EE Standards for Buildings	Currently not sustainable without outside funding for market surveys and research needed to establish and validate the feasibility of proposed lighting power density levels. National budget available is only RMB 50,000 per standard	Low
Output 1.3: Test Lab Consistency	Test lab operations appear to be sustainable. The quality and capacity of the lab have been upgraded, and it has proven through round-robin testing that it can meet international standards.	High
Output 2.1: Media Promotion Plan	Currently, the activity is located in a research institute and is not sustainable since (a) the research institute does not specialize in media promotion; and (b) there is no ongoing budget for media promotion and awareness.	Low
Output 2.3: Certification and Labeling	The certification program is sustainable, since it is fee-based and the fees cover its cost of operations. However, CECP will need to work to increase awareness of the label in the market and to convince manufacturers to apply the label to their products, if the labeling scheme is to be successful in the long run.	High
Output 2.4: Quality Commitment Program	Concept is sustainable, provided there is a budget for program management. Without such a budget, the program will likely stop being active at the end of 2005.	Medium
Output 3.1: Market Aggregation Activities (Bulk Purchase)	Concept is sustainable, provided there is a budget for program management. Rebates are not needed to make this program work. However, without a budget for program management, the program will likely stop being active at the end of 2005.	Medium
Output 3.2: Utility Based Programs (DSM)	The concept is sustainable, but requires (a) the interest of utility management and (b) the availability of SBC funds. While there are indications that several utilities are interested in adopting SBC mechanisms, but DSM will not scale up to a country-wide activity based on these 2 pilot programs.	Medium
Output 3.3: Energy Management Companies (EMCs): Financing of Lighting Projects	The EMC approach in the lighting industry appears very sustainable. According to the China EMC Association, 6 EMCs are currently actively pursuing performance contracts for lighting efficiency; and are expected to carry out approximately 10 projects on average each year.	High
Output 4.3: Review of Market/Project Progress	Overall, the survey and evaluation functions of the Green Lights Project do not appear to be sustainable. There is a lack of coordinated planning, oversight, and implementation of the survey and evaluation strategy. In the next phase, the PMO should manage a clearer process for developing a detailed, combined TOR for the survey and evaluation project components.	Low

Annex A: Lessons Learned and Sustainability for Each Sub-Project

Sub-Project	Lessons Learned	Assessment of Sustainability
Output 1.1: Product EE Standards	CNIS has demonstrated its capability to efficiently research and develop high-quality MEPS for lighting products.	Currently not sustainable without outside funding for market research, analysis, and other aspects of standards development.
Output 1.2: EE Standards for Buildings	Main lesson is that NDRC's input can be a critical factor in expediting the approval and focus by MOC on building lighting standards.	Currently not sustainable without outside funding for market surveys and research needed to establish and validate the feasibility of proposed lighting power density levels. National budget available is only RMB 50,000 per standard
Output 1.3: Test Lab Consistency	International cooperation through round-robin testing is an excellent way to upgrade skills and capability. Therefore, budget for equipment upgrades alone, without the round-robin testing would not have been as effective. Assistance by a highly qualified international expert with direct practical experience can be invaluable to the success of the effort.	Test lab operations appear to be sustainable. The quality and capacity of the lab have been upgraded, and it has proven through round-robin testing that it can meet international standards.
Output 2.1: Media Promotion Plan	Mass media operations should be embedded in an organization with mass media experience and skills. With a limited budget, it may be more strategic to focus more on program-related promotion and marketing instead of doing a less-focused mass media effort.	Currently, the activity is located in a research institute and is not sustainable since (a) the research institute does not specialize in media promotion; and (b) there is no ongoing budget for media promotion and awareness.
Output 2.3: Certification and Labeling	Programs for large purchases can be a significant driver for a certification program. Voluntary certification programs may not take hold in the consumer market without significant government resources to increase awareness of (and consumer demand for) the certification label.	The certification program is sustainable, since it is fee-based and the fees cover its cost of operations. However, CECP will need to work to increase awareness of the label in the market and to convince manufacturers to apply the label to their products, if the labeling scheme is to be successful in the long run.
Output 2.4: Quality Commitment Program	A quality commitment program, with a guarantee and local publicity can be highly effective at increasing sales of certified products. The cost of such an effort does not have to be very large.	Concept is sustainable, provided there is a budget for program management. Without such a budget, the program will likely stop being active at the end of 2005.
Output 3.1: Market	Bulk purchase can capture the attention of managers and be	Concept is sustainable, provided there is a budget for program

Aggregation Activities (Bulk Purchase)	effective at inspiring confidence in purchasers and also securing a significant price discount.	management. Rebates are not needed to make this program work. However, without a budget for program management, the program will likely stop being active at the end of 2005.
Output 3.2: Utility Based Programs (DSM)	Market-based approaches to promoting penetration of high-efficiency products can work in China. The SBC is an effective utility mechanism for delivering energy savings as a system resource, and that resource benefit can be measured and quantified. There is a need for complementary policies on government regulation (i.e. testing, certification) in order for DSM programs such as this to succeed.	The concept is sustainable, but requires (a) the interest of utility management and (b) the availability of SBC funds. While there are indications that several utilities are interested in adopting SBC mechanisms, but DSM will not scale up to a country-wide activity based on these 2 pilot programs.
Output 3.3: Energy Management Companies (EMCs): Financing of Lighting Projects Promoted	EMCs (ESCOs) are a good vehicle for promoting lighting efficiency projects, since projects can be completed quickly and are relatively easy to verify.	The EMC approach in the lighting industry appears very sustainable. According to the China EMC Association, 6 EMCs are currently actively pursuing performance contracts for lighting efficiency; and are expected to carry out approximately 10 projects on average each year.
Output 4.3: Review of Market/Project Progress	PMO needs to develop a clear and detailed TOR for the survey data and indicators at the very beginning of the project. There is a need to commit to a long-term, ongoing, consistent tracking survey, in order to continuously monitor the impact of programs and changes in the market. Survey and evaluation functions should be bundled together, either in one firm, or in a consortium that has both survey and evaluation capabilities.	Overall, the survey and evaluation functions of the Green Lights Project do not appear to be sustainable. There is a lack of coordinated planning, oversight, and implementation of the survey and evaluation strategy. This problem should be remedied in the next phase, with the combination of the survey and evaluation elements, and with the PMO managing a clearer process for developing a detailed, combined TOR for the survey and evaluation project components.

Annex B: List of Meetings

Output	Subcontractor	People Met
1.1 Product EE Standards	China National Institute of Standardization Sub-Institute of Resource and Environment Standardization,	Ms. Chen Haihong Senior Engineer
1.2 EE Standards for Buildings	China Academy of Building Research Institute of Building Physics	Mr. Zhao Jian Ping, Professor Mr. Zhang Shaogan
1.3 Test Lab Consistency	National Lighting Testing Center National Electric Light Source Quality Supervision Test Center	Mr. Hua Shuming, Director Mr. Li Jia Yang, Engineer Ms. Judy Shi, Engineer
2.1 Media Promotion Plan	Beijing Energy Efficiency Center (BECON)	Ms. Yu Cong, Director Ms. Liu Jing Ru, Asst. Research Professor
2.3 Certification and Labeling	China Certification Center for Energy Conservation Product (CECP)	Mr. Guoqin Zhang Development Dept.
2.4 Quality Commitment	Materials Energy Center China Energy Conservation Association	Mr. Xu Pei Xin Mr. Yu Weiping Ms. Li Jingyi
3.1 Market Aggregation Activities (Bulk Purchase)	Beijing De Taiheng Economy and Technology Consulting Co.	Mr. Yang Ziwei
3.2 Utility Based Programs (DSM)	Beijing Huaxia Zhengtian International Information Consultation Co., Ltd.	Prof. Yang Zhirong, Consultant
3.3 Energy Management Companies	China EMC Association	Mr. Wu Jie
4.1 Project Implementation Structure	Project Management Office	Mr. Han Wenke, Director, PMO Ms. Liu Hong, Deputy Director, PMO Ms. Chen Feiran, CICETE
4.3 Review of Market/Project	CECIC Blue Sky Investment Consulting and	Ms. Ding Hang, Deputy Director

ANNEX B

Output	Subcontractor	People Met
Progress	Management	Ms. Fan Lijuan, Project Manager
	All China Market Research – Surveys	Lily He, Vice President Fred Bai, Vice President Laura Lv, Project Manager
4.4 Strategy for Sustaining Project Activities	CECIC Blue Sky Investment Consulting and Management	Mr. Lu Shao Yang Senior Engineer
OTHER: CICETE	China International Center for Economic and Technical Exchanges	Ms. Chen Feiran
OTHER: Manufacturers	Guangdong Bright Star Light & Electricity Co., Ltd.	Mr. Chai GuoSheng, President Mr. Zhang Ming, Chief Engineer Mr. Li Yue Qi, Vice Manager of Sales Dept. Ms. Jenny Long, International Trade Dept.
	Osram China Lighting Ltd.	Dr. Liu Jianping, Director Product Marketing & Technical Support Mr. Zhang Junbin, Product Manager
	CALI (China Association of Lighting Industries)	Chen Yang Sheng, President

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Annex D: Terms of Reference for Final Evaluation of China Green Lights Project

China Greenlights - Final Independent Evaluation Terms of Reference

Section 1: Introduction

The China Greenlights project is a Chinese Government and UNDP joint initiative to improve the quality of Chinese efficient lighting products and to stimulate the demand for these lighting products both nationally and internationally. The project formally commenced in September of 2001 and is now entering its final year.

As part of the original project design, a series of milestones were laid out for completion within the first 18 months and 36 months of project operation (Phase I and II respectively). The original project document stated that at the end of Phase I and II an independent evaluation should be undertaken to establish the extent to which the milestones were attained and to confirm whether or not the overall project remained on course to fulfil the original project intent (or, if the project was not on the appropriate course, to recommended actions to refocus the project accordingly). Both these evaluations have been completed, and where appropriate, recommendations implemented. However, as the project approaches completion it is necessary to perform a final overall project evaluation to establish the success of the project in meeting its objectives, to make recommendations for future actions and to highlight any lessons to be learned for other projects under development or being implemented.

The remainder of this document details the aims and objectives of the proposed final evaluation, the anticipated outputs from the evaluation, and the proposed timescales.

Section 2: Evaluation Aims and Objectives

The aim of the work is:

> *"To conduct an over evaluation of the China Greenlights project to establish the degree to which the project has achieved the specified goals, to make recommendations for future actions and to highlight any lessons to be learned"*

Specific objectives for the evaluation are:

1. Establish the extent to which the overall project goals (as identified in the original project document and inception report) have been achieved;
2. Assess the viability of ongoing sustainability plans and make recommendations for amendments to these plans if appropriate;
3. Identify key lessons to be learned from the project that can be relayed to improve other projects currently being implemented of under preparation.

Section 3: Evaluation Activity

It is anticipated that part of the evaluation will desk based (reviewing the original project and inception documentation, project outputs and the ongoing monitoring and evaluation material

generated as part of the normal project activities). However, it is vitally important that the evaluation takes full account of the views of a full range of stakeholders; in particular NDRC, the PMO, the UNDP and the GEF, but also other actors including all major local subcontractors, some national/international experts, manufacturers, supply chain members, etc. It is anticipated that the views of this groups will be collected primarily through in-depth face to face interviews.

Section 4: Outputs

It is anticipated that the evaluation will result in a comprehensive written report detailing:

- The extent to which overall project goals have been achieved;
- The viability of ongoing sustainability plans and recommendations for amendments to these plans if appropriate;
- Key lessons to be learned from the project that can be relayed to improve other projects currently being implemented of under preparation.

A draft report will be prepared and the findings presented at a workshop of all key project actors. Appropriate account will be taken of the views of these actors in preparing the finalised version of the report. A final mission will also be undertaken to attend and provide suitable feedback to the final project Tripartite meeting.

Section 5: Timescales

It is currently anticipated that the project will be completed in-line with the schedule, i.e. by September of 2005, and it is hoped that this evaluation will also be completed within that timescale. However, although the majority of activities will be reaching completion early to mid-2005, several activities will not complete until late in the project. In particular the project supported ESCO activity and the 2005 survey data collection will not be completed until mid-August. Therefore it is proposed that the evaluation timescales are as follows:

Desk Research (on documents supplied by the PMO): 5 day mid-August 2005;

Mission 1 (2 weeks – late August):	Interviews with the majority of stakeholders and presentation of outline findings/recommendations;

Draft Report Completion and Submission (3 days – to be submitted by September 15th)

Mission 2 (1 week mid/late September):	Clarification of outstanding issues and interviews followed by formal presentation of final report;
Mission 3 (2 days mid/late October):	Attendance and presentation/comments to the final project Tripartite meeting.

Overall it is estimated that the desk review, the comprehensive interview schedule, the draft report preparation and presentation, and the formal report completion and submission will take 35 days.