BECON NEWS

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Special Issue
on the

China Green Lights Program

This edition of BECon NEWS introduces readers to the on-going China Green Lights Program, a comprehensive strategy to increase market penetration of high-efficiency lighting goods and services. The Beijing Energy Efficiency Center (BECon)[1] has played an active role in designing, organizing, and implementing the Program, which is financially supported by the Chinese government and the United Nations Development Programme (UNDP). As a member of the China Green Lights Project Office, BECon is helping to carry out one of the key energy efficiency projects of the 9th Five-Year Plan (1996-2000) issued by the State Economic and Trade Commission (SETC). The contents of this issue include the following:

Targets of China Green Lights Program:

***Saving electric energy**: During the 9th Five-Year Plan, the popularization of 300 million compact fluorescent lamps (CFLs), thin tube fluorescent lamps and other high efficiency illumination products will enable savings of 22 billion kilowatt-hours of electricity at the terminal.*

***Reducing environmental pollution**: By the year 2000, a total reduction of sulfur dioxide emissions of 200 thousand tons and carbon dioxide emissions of 7.4 million tons can be achieved.*

***Establishing the market**: By creating a market-driven demand for high-efficiency lighting products, China will minimize expenditures for the associated gains.*

***Improving quality**: Pay greater attention to efforts to upgrade the quality of energy efficient products by improving quality standards and the certification system.*

1 Please see page 7 for a list of acronyms.

Program Rationale

Since reformation and opening to the outside world, China has rapidly expanded development of the electric power industry. Total power generation in China exceeded 1000 TWh in 1995, quadrupling the output of 1978. However, shortages of electric power supply, especially at times of peak load, and low efficiencies in the use of energy remain serious problems. This situation will continue in the near term.

Electricity consumption by lighting accounts for approximately 10% of the total electric power consumption in China today. Low efficiency devices, such as incandescent lamps and magnetic ballasts, still dominate China's lighting sector, leading to high electricity consumption and environmental pollution. In 1994, more than 400 domestic producers produced 2.4 billion incandescent bulbs and 300 million fluorescent lamps (80 million of them CFLs and 64 million of those exported). Saving electricity in lighting will both reduce power shortages that create huge lost potential for Chinese industries and protect the environment. Additional benefits include reduced peak load and improved quality of the power supply.

Electric energy saving in the illumination field has obvious economic benefit. According to calculations, the investment needed for saving one-kilowatt of power generation capacity in China is half of that for the construction of newly built electric power plants. The average cost for the users of energy efficiency products is only one-third of the terminal cost of the power supply. The average recovery period for the investment input of the electric energy savings is no more than one year on average. In the 9th Five-Year Plan interval (1996-2000), total investment for the construction of electric power facilities could be reduced by 49 ~ 63 billion Yuan (US$1÷ 8.3 Yuan) . After deducting the investment needed for this level of electric energy saving, the actual reduction could be 30~40 billion Yuan.

Following the development of the economy, and people's requirement for improved residential conditions, the lighting industry has received considerable attention. The demand for high efficiency illuminating appliances continues to grow. These conditions provide a wide market for implementing the Program.

Currently, the following barriers are preventing the further spread of energy efficient lighting products in China: low technological level of production, unstable product quality, and low service life compared to international levels. These problems will be studied intensively and addressed during the implementation of the Program.

The China Green Lights Program aims to popularize high efficiency lighting products; to save electric energy used for lighting; to promote the manufacturing industry of the new lighting appliances; to improve the competitive power of enterprises; and to protect the environment.

Program Activities Review

In 1993, the SETC organized relevant departments, institutes, and experts to research implementation of the China Green Lights Program.

In May of 1996, the SETC, as leader, joined with the State Planning Commission (SPC), the Chinese National Council of Light Industry (CNCLI), the Ministry of Electronics Industry (MEI), the Ministry of Electric Power (MEP), the Ministry of Construction (MOC), the China Science Academy (CSA), the China Energy Conservation Investment Corporation (CECIC), the MOA, and others, to establish the China Green Lights Program's makeup: a Coordination Leadership Group, a Project Office, and an Experts Group. BECon is a key member of the Project Office.

In the first half of 1996, the SETC, the CNCLI, the MEI, and the Ministry of Agriculture (MOA) jointly issued a Survey on Efficient Lighting Equipment. The

Project Office organized the survey on lighting industry enterprises, and set up a database covering more than 130 lighting enterprises.

Also in May of 1996, the Project Office, under the assistance of the China International Center for Economic and Technology Exchange (CICETE), the Ministry of Foreign Trade and Economic Cooperation, submitted an application for technical and financial assistance from UNDP.

The following month, Mr. Shi Wan-Peng gave an important speech at the first meeting of the Coordination Leadership Group. He addressed the necessity of intensifying implementation of the Program.

In the middle of June, the SETC issued the Program's Implementation Plan. The Plan detailed the Program's feasibility, expected objectives, major undertakings, institutional framework, and other topics. Some of the local and sectorial government agencies who received copies of the Plan set up Green Lights offices. The State Technical Supervising Bureau (STSB) held a high level meeting to discuss and arrange relevant standard's research and formulation in order to better coordinate the Program.

In October of 1996, UNDP approved the Program and agreed to offer substantial technical and financial support. This program encourages consumers to participate in the Program.

This year's National Energy Conservation Week, held annually in mid-October, especially focused on Green Lights information dissemination. Many national and local newspapers, magazines and television stations reported on green lights, the opening ceremony of the Beijing Green Lights Exhibition Center, and the 1996 International Symposium on Green Lights in China.

The Beijing Green Lights Exhibition Center was officially opened at October 7th, 1996. Over 15,000 individuals and 800 organizations have already visited the 3,500 square meter exhibition center. The center has three goals: to enhance the public's concern of energy conservation, to improve the quality of efficient lighting products, and to cultivate a healthy market competition mechanism.

On October 11th and 12th, the 1996 International Symposium on Green Lights in China was held in the Beijing International Conference Center. This first-ever Symposium was hosted by SETC and Philips Ltd. Co., and organized by the Project Office. Participants included members from Chinese governmental and research agencies, domestic and foreign lighting enterprises, and others with an interest in energy efficiency. The Symposium introduced the objectives of the Program, outlined the trends of international lighting industries, and discussed ways to develop and improve efficient domestic lighting equipment.

In November of 1996, under the assistance of the CICETE, relevant agencies signed different sub-contracts under the UNDP-approved China Green Lights Program. Those agencies include the State Electric Lighting Source Standardization Center, the National Energy Management Standardization Technical Committee, the China Lighting Society, the China Lighting Equipment Association, Tsinghua University, the Energy Research Institute (ERI), BECon, and others. This subcontracting work aims to formulate energy-saving standards for building-design lighting systems, complete surveys on production enterprises and consumers' concerns, operate the Beijing Green Lights Exhibition Center, and research green lights policies and standardization.

In December of 1996, the Project Office organized a site survey of three quality testing centers for lighting equipment and products recommended by the STSB. These centers are the National Electric Lighting Source Quality Supervising and Testing Center, located in Beijing; the Guangzhou Electric Appliance Safety Testing Institute, located in Guangzhou, Guangdong Province; and the National Daily-Use

Electric Appliance Quality Supervising and Testing Center, also located in Guangzhou.

Program Implementation Plan

In the middle of June, 1996, the SETC issued the Program's Implementation Plan. Detailed major approaches for the implementation of the China Green Lights Program are:

1. Improvement of Policies and Regulations and Enhancement of Macro Adjustment and Control.

- Modify regulations and rules concerning energy efficient lighting products and product technical standards.
- Establish a certification system for efficient lighting products. Perform certification tasks for efficient lighting products by relying on the existing monitoring and testing capacity, and governmental organs such as the STSB.
- Study and map out encouraging policy which is beneficial to energy efficiency lighting. Pay attention to successful domestic experiences and international implementation plans. Research the feasibility of economic measures including optional rate and rewards for electricity saving.
- Promote energy-saving technical service agencies to participate in the Program through a new operating mechanism of sharing both investment risks and electricity saving's benefits between consumers and investors.
- Establish stepwise a National Green Lights Information System; and provide information services for policy making, academic research, engineering design and production to all users.

2. Normalization of Market Behavior and Encouragement of Fair Competition.

- Announce certified energy efficient lighting products conducive for market operation.
- Perform quality assurance measures for efficient lighting products. For all efficient lighting appliances which obtained certification qualification, a quality and application guarantee certificate shall be provided. Any unqualified products must be guaranteed for unconditional replacement. In serious circumstances, violators will be fined.
- Establish a sampling inspection and monitoring system for the lighting market and publish the results to discourage poor quality and low efficiency lighting appliances in the market.

3. Typical Demonstration

Principles

- All measures should be suited to local conditions.
- Benefit should be two-fold: both the saving of electricity and cost are required. The unification of the benefit of the society and the economic benefit of users is to be realized.
- Typical demonstrations should have sufficient representiveness and influences, so that they can be disseminated in China conveniently.

Scope

- Demonstration in municipal public lighting.
- Demonstration of applications for energy efficient lighting products.
- Demonstration of an energy efficient retrofitting project in a big hotel and a big mall.
- Pilot project for engineering design of energy efficient lighting facilities in a newly built project.

4. Highlighted Support

On the basis of investigation, assessment, and certification, and relying upon the currently existing basic conditions, provide support to some key lighting appliance production enterprise projects that rely on high technology capacity.

5. Information Dissemination and Education.

The focus is to enhance the public awareness of electricity saving in lighting, as well as to popularize scientific knowledge of electricity conservation.

- Through a variety of media including television, radio, journals, newspapers, exhibitions, picture albums and other reading material, disseminate information about the China Green Lights Program to the public.
- Launch regular public activities such as lectures, seminars, and consultations concerning the Program to popularize knowledge and introduce experience about electricity saving, and help production and marketing enterprises as well as the users of the lighting products overcome existing psychological barriers.
- Establish China Green Lights Program Exhibition Centers in big cities like Beijing, Shanghai and Guangzhou so as to link up the connections among the production enterprises, marketing enterprises and the users of the illuminating products. These Centers should act as the bases for science popularization, dissemination and training, and windows for promotion of energy efficient lighting products.

6. International Cooperation

Make adequate use of the "Two Kinds of Resources and Two Markets." Widely develop international exchange activities, seek support from international multi-lateral institutions and international organizations, attract foreign lighting product manufacturers to joint the Program, absorb the successful experiences which are good for Chinese laws and market management, and promote the development of the Chinese energy efficient lighting product industry.

Program Organization

In May of 1996, the SETC joined with the SPC, the CNCLI, the MEI, the MEP, the MOC, the CSA, the CECIC, and the MOA to form the Coordination Leadership Group. Mr. Shi Wan-Peng, Deputy Minister of SETC, is the Director of the Coordination Leadership Group.

The Project Office includes the SETC's Department of Resource Conservation and Comprehensive Utilization, the SPC's ERI, BECon, the China Energy Conservation Association, and the China Resource Comprehensive Utilization Association.

The Expert Group is composed of researchers and officials from the energy and lighting industry, government agencies and enterprises, and research institutions.

The 1996 International Symposium on Green Lights in China

On October 11th and 12th, the 1996 International Symposium on Green Lights in China was held in the Beijing International Conference Center. Sponsors for this first-ever Symposium included: Department of Resource Conservation and Comprehensive Utilization of the SETC, Department of Foreign Affairs of the SETC, Philips Electronic China Group. Co-sponsors included China Energy Conservation Association, Matsushita Electric Works, Ltd., Motorola Lighting Inc., OSRAM GmbH, Toshiba Light & Technology Corp., and many others.

In total, 140 participants including government officers, researchers, and domestic and overseas producers presented during the seminar. Mr. Zhang Wu-Le, Vice Chairman of the SETC, gave the opening ceremony speech. The objectives of the Program were detailed, experiences of

similar green lights programs implemented in the US, Japan and Southeast Asia were introduced, and discussions on how to develop and improve Chinese efficient lighting projects were held. During the Symposium, participants visited a small lighting equipment show, which demonstrated advanced international products. Many participants strongly suggested the Symposium should be held again in the future.

Program Barriers

The Program is a comprehensive, systematic project involving factors relating to raw materials, components, production equipment, technology, management, marketing, consumer behavior and macroeconomics. Currently, the following barriers are preventing the further spread of energy efficient lighting products in China:

- Coordinated development of materials and necessary fittings is not satisfactory and does not fit the requirements of industrial development.

- Standards, regulations and policies are incomplete.

- Most high quality equipment is exported. The ones that remain in China are of low quality and give a bad name to efficient lighting products among Chinese consumers.

- The production capacity of lighting enterprises is rather small. There are over 400 domestic manufacturers of CFLs in China, giving the country one-third of world production volume. There are only a few large producers with annual production capacity around 5 million units, but these cannot match popular foreign brands in terms of quality or market penetration. Most domestic producers use low technologies, resulting in poor product quality. In general, the infrastructure of the lighting products sector is not rationalized.

- Cheap and low quality products from private producers and high quality products from foreign producers and joint ventures severely challenge state-owned enterprises, which lack investment capital and marketing experience. The state-owned producers can only compete with others by lowering the cost and quality of their products.

- Imported production lines do not work properly because domestic raw material is not appropriate, and there is a lack of technical know-how. Wasted capital amounts to over 100 million Yuan.

- Most manufacturers expand their production lines by simply increasing their stocks of partially automated equipment, in which case the quality of the products is not improved.

Preliminary Work Plan for 1997

1) Forbid low quality products and improve market functioning.
One of the main barriers in implementing the Program is that consumers hesitate to buy efficient lighting products because they cannot tell which brands have adequate cost-benefit characteristics. The Project Office plans to create a program called "Promotional Campaign for High Quality Products," which aims to improve consumers' purchasing power, help producers improve their product quality, and assist key enterprises better penetrate available markets. The STSB plans to inspect the quality of energy efficient lighting products and pay particular attention to CFLs, and thin tube fluorescent lamps. Relevant governmental departments will take unified administrative, economic and legal action as required to prohibit low quality products.

2) Formulate and improve product quality

standards and building design standards of efficient lighting. Lighting products in China do not have standards, or existing standards are not fully established. Building design standards do not consider energy conservation in lighting components. It is anticipated that future state standards for CFLs and residential building design standards for efficient lighting, which include attention to energy conservation, will be formulated in 1997.

3) Intensify information dissemination and exchange.

   - Further develop the Beijing Green Lights Exhibition Center as a window to disseminate green lights' information, and to serve as a model for future exhibition centers.
   - Advertise in newspapers, magazines and broadcasts to raise public awareness of efficient lighting and products banned due to low quality.
   - Produce a series of TV programs to disseminate information on green lights.

4) Continue research and investigation based on previous experiences.

5) Assist in developing new technologies, including the expansion of CFLs lifetimes from 2000 ~ 3000 hours to 4000 ~ 5000 hours.

6) Compile and assess experiences of the existing demonstrations.

7) Help selected key manufacturers better market and improve their products.

BECon's Involvement in the China Green Lights Program:

Mr. Zhou Dadi is deputy director of the Project Office; Ms. Yu Cong and Ms. Liu Hong are members of the Project Office; Mr. Yang Zhirong and Mr. Xin Dingguo are members of the Expert Group of the China Green Lights Program.

BECon has assisted the Project Office with UNDP technical and financial input, helped organize the 1996 International Symposium on Green Lights in China and played a role in starting the Beijing Green Lights Exhibition Center.

Acronyms

BECon	Beijing Energy Efficiency Center
CECIC	China Energy Conservation Investment Corporation
CFLs	compact fluorescent lamps
CNCLI	Chinese National Council of Light Industry
CICETE	the China International Center for Economic and Technology Exchange
CSA	China Science Academy
ERI	Energy Research Institute
MEI	Ministry of Electronics Industry
MEP	Ministry of Electric Power
MOA	Ministry of Agriculture
MOC	Ministry of Construction
PNNL	Battelle, Pacific Northwest National Laboratory
SETC	State Economic and Trade Commission
SPC	State Planning Commission
STSB	State Technical Supervising Bureau
UNDP	United National Development Programme

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