

Status Report on Energy Efficiency Policy and Programs in China

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Background

China's activities in promoting energy efficiency may have played a role in the reduction in total energy consumption in the country since 1996. The decline in China's output and consumption of primary energy has been driven by changes in China's most important fuel, coal. Estimated total primary energy use in 1999 will be nearly 6% below the 1997 peak. Meanwhile, consumption of oil and electricity have continued to grow. On the supply side, China has undertaken a campaign to close or curtail production at thousands of coal mines. On the demand side, available evidence is not conclusive and data not always reliable, but indicates that slowing economic growth and reform in the state-owned sector has led demand in industrial sectors users to drop due to closures and reductions in output. Households have continued their rapid switch from coal to gas fuels and electricity. The average quality of coal may be increasing, allowing end users to use less. Moreover, across all sectors, equipment turnover has continuously raised efficiency.

Many factors are behind the improvements in energy efficiency, including rising energy prices and general economic growth stimulating purchases of new equipment. An essential element has been the continuing commitment of the Chinese government to promoting energy efficiency, which is devoting considerable energy to developing new policies and programs that will be effective under the changing conditions of China's transforming political economy. This paper describes developments in energy efficiency policy in China over the past several years, particularly since the passage of the Energy Conservation Law (ECL) in 1997.

Energy Conservation Law (ECL)

Early Activities (November 1997 to end of 1998)

China's Energy Conservation Law (ECL) was approved on 1 November 1997 and came into force on 1 January 1998. The ECL consists of 50 articles in 6 chapters, including (1) general provisions, (2) energy conservation management, (3) rational energy utilization, (4) technology progress, (5) legal liabilities, and (6) supplementary rules. The law aims to promote energy conservation activities throughout society, to improve energy efficiency and increase economic benefits thereof, to protect the environment, to ensure economic and social development, and to meet the needs of people's livelihood.

The law states that the government should:

- encourage energy efficiency, as well as development and use of new and renewable energy;
- formulate energy conservation policy, compile energy conservation plans, and incorporate them into the economic and social development plans of the nation
- develop policies and plans that ensure rational energy utilization, and coordinate those plans with environmental protection and economic growth;
- stimulate and support technology R&D and scientific research in energy conservation as well as application and dissemination;
- strengthen educational activities and propaganda in energy conservation to disseminate scientific knowledge and increase public awareness of energy conservation.

The ECL is broad in its provisions, and gives little guidance for implementation—characteristics that were necessary for the ECL to be passed. Responsibilities among organs of the government are broadly defined, and leave areas of uncertainty and potential overlap. Formulation of specific rules and methods is left to planning and implementing organs of the central and local governments.

One of the early task in carrying out the ECL was to decide on the respective spheres of authority and roles of the State Development Planning Commission (SDPC) and the State Economic and Trade Commission (SETC). Initially it was not clear whether SDPC would retain its former role as the national coordinator for the government's energy-efficiency activities. After internal consultations, SDPC was given overall policy authority for energy efficiency, while was SETC given the more central role as the authority over implementation.

After passage of the ECL, SDPC adopted recently issued regulations to begin the process of compiling supporting regulations for the ECL. One such document was the set of cogeneration regulations, issued in 1997, which sought to encourage retrofits of existing facilities and development of new cogeneration units through a variety of incentives.

Another document was the Policy Outline for Energy-Conserving Technologies, also issued in 1997. This document laid out a comprehensive set of specific technical goals, e.g., abolition of certain types of equipment and adoption of particular technologies, for sectors and for product classes (such as boilers and electric motors) common to many sectors.

SDPC also issued regulations related to the provisions of the ECL, though not necessarily stemming from it. The renewable energy policy issued in 1998 falls into this category, as energy efficiency and renewable energy supply are generally administered by the same government agencies in China, and are both seen as means of reducing reliance on fossil fuels. The renewable energy policy included measures to promote development of wind farms, and to create an obligation for utilities to purchase power generated from renewable resources. This latter provision is similar to efforts to promote grid connection of cogeneration facilities, and is part of a broader trend to integrate more distributed generation into China's electric power system.

One of SETC's activities was to establish, jointly with the State Bureau of Quality and Technical Standards (SBQTS), the Energy-Conserving Products Certification Commission. The Commission has the authority to certify standards for testing and labeling.

Like SDPC, SETC issued regulations, but, consistent with its orientation towards implementation, ones mainly concerned with implementation. Management provisions for key energy-consuming enterprises were issued in 1998. These provision were, however, more a restatement of measures favored under the planning system, and did not represent an advance in promoting energy efficiency under changing economic conditions.

In the spring of 1998, SETC published a list of energy-intensive equipment that was to be taken out of service. Like many such lists issued previously, this one included small fossil fuel-fired power plants. Another list covered obsolete transportation equipment, and required vehicles in urban areas over 15 years old to be destroyed.

SETC also issued guidance on investment of central government funds. This document sets limits on the scale of facilities that can receive such funds, to ensure that investment goes to those that achieve certain economies of scale and levels of energy efficiency. Other investors (local governments and non-state sources) are also discouraged from investing in small-scale facilities.

More Recent Activities (1999)

The ECL requires provincial-level administrations to formulate sets of implementing regulations in accordance with the ECL, taking into account local economic and environmental conditions. So far, Shandong, Zhejiang, and Shanghai are the only provincial administrations that have done so. According to a report prepared for the Natural Resources Defense Council (NRDC), the ECL and the provincial regulations "are...characterized by (1) vague, aspirational language, (2) lack of clear division of government responsibility, and (3) insufficient detail on enforcement mechanisms." (Wang, 1999). The regulations cover the same basic areas as the national law, with varying differences in coverage, such as

more or less detail on legal liabilities for breach of provisions of the ECL. Typically, actions are encouraged or supported, and rarely required, and even where actions are required, little specific guidance is supplied (e.g., no procedures are recommended for setting standards). Wang concludes that the regulations give local administrations that are supportive of energy conservation a tool with which to pursue their initiatives, but little enforcement power.

Wang (1999) also reports on the status of national-level energy efficiency standards:

- “*National energy conservation standards (general and design)*: Some of the standards have been created pursuant to ECL, Articles 12 and 14. The State Bureau of Technical Supervision is responsible for formulating these standards.
- “*List of prohibited industrial projects*: This list (pursuant to ECL, Art. 13) has been created by the SETC.
- “*Production energy consumption limits per physical unit of product*: These limits (pursuant to ECL, Art. 16) have not yet been set at the national level. The State Bureau of Technical Supervision is responsible for these standards.”

SDPC is reportedly dissatisfied with progress on drafting of local energy efficiency regulations. Typically, the local regulations duplicate the content of the national law, and do not provide rules and guidance specifically tailored at targets of regulations within the local jurisdictions, or any innovations, as was expected. There are a few exceptions. Shanghai, for instance, has created a uniformed inspectorate of energy efficiency, with the power to enforce regulations such as closures of facilities that do not comply with regulations formulated under the ECL. This approach has not yet been put to the test, however, and may be subject to legal challenge.

SETC has continued to develop regulations aimed at carrying out provisions of the ECL. Another directive banning small fossil fuel-fired power plants was issued in 1999—implying that shutting down small plants remains difficult.¹ In the autumn of 1999, SETC directed that hundreds of small cement and glass plants, mainly in northern China, be shut down for energy-efficiency and environmental-protection reasons. A list naming the targeted plants was published. This action is similar to the closings of hundreds of small paper mills undertaken in 1997 and 1998 by SEPA and SETC, although that campaign was motivated primarily by concerns about water quality.

SETC is focusing its implementation on key enterprises in the most energy-intensive sectors, including promotion of both improvements in energy management and adoption of new technologies. For instance, SETC is interested in implementing an Aluminum Challenge program to improve efficiency in that sector (though the quality of China’s aluminum ore limits the potential for intensity reduction).

China has received and continues to receive a variety of technical assistance in implementing the ECL. NRDC has provided support for local application of the ECL. The China Energy Conservation Association (CECA), with assistance from LBNL, is being supported by the China Sustainable Energy Program² (CSEP) to carry out a project for the SETC that aims to update energy-conservation implementing regulations to better suit them to current technological conditions and the transforming economic system.

Tenth Five-Year Plan (2001-2005)

SDPC is in the process of preparing the Tenth Five-Year Plan (FYP), which will run from 2001 to 2005. The Beijing Energy Efficiency Center (BECon) under the Energy Research Institute (ERI) has been given

¹ Statistics from the State Power Corporation indicate that, in recent years, the number and share of power plants under 50 MW has actually risen.

² The China Sustainable Energy Program is a joint program of the Packard Foundation and the Energy Foundation.

responsibility for preparing the plan, including policy recommendations and technical targets.³ Preparation includes a thorough review of national, sectoral, and local implementation of past policies and programs and an analysis of outcomes. This analysis, combined with an evaluation of technologies and policies adopted internationally, will be used as a basis for the draft plan. In the course of preparation, BECon is consulting with the sectoral and provincial authorities, who will actually implement the provisions of the Tenth FYP, in order to build consensus and to ensure that the recommendation and targets are practical. Compared to the emphasis on retrofits in previous plans, the Tenth FYP will devote more attention to achieving improvements in energy efficiency through installation of high-efficiency equipment and processes at new facilities, and through optimization of China's overall energy structure (Price, 1999).

SDPC is seeking to enhance its capability to update its plans and targets on an annual basis. To this end, it is seeking to develop a modeling tool and appropriate sectoral databases that could be used for scenario-based planning, policy analysis, and target-setting. Scenario outputs would include changes in energy use, pollutant emissions, and cost-benefit analyses. ERI, with assistance from sectoral experts in China, LBNL, and other US partners, will develop this capability, funded by CSEP.

Jiang Zemin and Zhu Rongji have recently announced that provisions of the Tenth FYP will have to be revised to conform to the terms of accession to the WTO. Most industrial sectors will no longer be as protected from international competition. Those that do remain protected to some degree will be basic infrastructure and transportation. While there may be no direct implications for the energy efficiency provisions of the Tenth FYP, the resulting changes in economic activity are certain to affect energy efficiency throughout the economy.

While the Tenth FYP will likely make no mention of climate change mitigation measures, there was debate among policy makers in China on how to treat climate change in the Plan. It is likely to receive mention in language describing the environmental challenges that China faces and that the Plan is designed to overcome, but there will almost certainly be no mention of specific actions, targets, or baselines. Still, it is evident that policy makers are seriously weighing the issue, and studying mitigation efforts, including low-carbon fuels and end-use energy efficiency. A program was recently begun to send members of China's climate change negotiating team to the US for training on "no regrets" energy technology and policy measures.

Energy Efficiency Investment and Technical Assistance

Energy Conservation Project

The three pilot Energy Management Centers (EMCs) established in Shandong, Beijing, and Liaoning through the World Bank's Energy Conservation Project (with GEF and EU co-funding) have successfully completed two years of start-up and initial operation, including assessment of and performance contracting for small-scale local energy-efficiency projects. The three demonstration EMCs, which are basically energy service companies (ESCOs), appear to be commercially viable. The EMC project is now moving into its second phase, in which centers will be established in other regions. A key difference in this second round is that the new centers will be domestically funded, unlike the three pilot centers, which received substantial international financial assistance.

Another element of the Energy Conservation Project is implementation of an Energy Conservation Information Dissemination Center. This center was established in 1998 as a non-profit under SETC. The center will provide information on energy-efficient products, including case studies of application of specific equipment and financial analysis of project outcomes, and technical assistance.

A new GEF-funded project on energy efficiency, based on the US Motors Challenge program, is being discussed with China.

³ Another center at ERI, the Center for Renewable Energy Development, is drafting the renewables section of the Five-Year Plan.

Energy Conservation Centers

China established over 200 Energy Conservation Centers in the 1980s in various local administrations and sectoral agencies. Their mission is to assist enterprises design energy-efficiency projects, use energy-efficient equipment appropriately, and provide training and information. In 1998 there were 1980 of these centers, employing 3,200 people (Price, 1999). Many of them may be closed or merged. Some of those that are left may become part of new Energy Management Centers created under the EMC project.

China Energy Conservation Investment Corporation (CECIC)

CECIC is a state-owned company that, until recently, supervised the lending of two billion yuan (about US\$240 million) for energy-efficiency investment projects, primarily combined heat and power cogeneration and industrial energy-efficiency projects. The company was formerly an arm of the SDPC, charged with similar duties. CECIC performed technical and financial analysis of projects, and directed loans to projects within the technical and policy guidelines set by SDPC, while state-owned commercial banks (i.e., the China Construction Bank (CCB) and the Industrial and Commercial Bank of China (ICBC)) did the actual lending and management. Unfortunately, loan recipients (typically state-owned companies themselves) have tended to treat loans from CECIC in the same fashion as loans channeled to projects by government agencies, that is, the borrowers often feel they can default on the energy-efficiency loans. Consequently, performance of CECIC's portfolio of loans has been less than ideal. CECIC no longer has the authority to approve loans, and only evaluates potential projects on their technical merit, essentially acting as a consultant to CCB, which is now the only bank involved in central government-sponsored lending to energy efficiency projects.

CECIC has its own capital resources as well, which it uses to invest in a variety of projects. Currently, only about one fifth of CECIC's business is in energy-efficiency projects. Some investments are in ventures completely unrelated to what was intended to be CECIC's core business, while other investments are related, e.g., a joint venture called Green Capital that is arranging financing for new coal washing facilities mandated under the clean air legislation.

CECIC has indicated its interest in becoming one of the EMCs under the Energy Conservation Project that the World Bank and GEF are funding.

A contract has been signed that would provide, under SDPC's authority, one billion yuan (about US\$120 million) to capitalize an "environmental protection investment fund". Funds come from UNIDO, with some private capital, as well. Meant to be a self-sustaining, private venture, this fund will lend to projects that are environmentally beneficial, according to criteria to be set. The structure of the fund is currently being worked out. One possibility is an arrangement similar to previous lending for energy efficiency projects, by which a management organization, to be established under (but not within) CECIC, would evaluate and select projects, while a commercial bank would carry out the actual lending and loan management. A recent news report gave other details (Appendix 1).

CECIC continues to promote cogeneration in China. With support from CSEP and technical assistance from Energy Resources International, efforts are being made to further create an institutional environment conducive to domestic and foreign investment in cogeneration projects in China.

Green Lights

Since its launch in 1996, the China Green Lights Program (CGLP) has been very successful in raising the awareness of available energy efficient lighting technologies, and has contributed significantly to the substantial increase in the production and use of these efficient lighting technologies. The program has been run by SETC, with technical support from BECon and a panel of technical experts.

Experience so far with the Green Lights program has highlighted two major barriers to greater use of more efficient lighting equipment in China: (1) high initial cost of more efficient technologies, and (2) poor

quality of some of the efficient products made in China. The quality and price/cost issues are inter-related. While Chinese-made components and raw material and production process remain problematic, the poor quality of the final products is more often the victim in manufacturers' drive to reduce product costs, in the absence of product quality standards, rigorous monitoring and an enforcement mechanism. Thus, developing and implementing product standards is the most important step in improving the quality of Chinese-made lighting products.

Higher costs of the efficient lighting products are a major barrier to their diffusion in every market. In the developed economies, utility-based demand-side management programs have been the major vehicles to reduce end-user cost. While there has been interest expressed by the Green Lights Program Office about experience with Western Countries in utility sponsored demand-side management (DSM) activities, it is currently difficult to initiate such programs in China. However, there remain strong interests both in the central and local governments in pursuing energy conservation programs.

Much of the advertising campaign to date, and development of sales has focused on screw-in CFLs with permanently attached ballasts. While the public is generally aware of the energy saving potential of CFLs, little information is available to help the end-users to understand lighting quality issues in lighting retrofit as well as the economics of lighting retrofit.

The focus on CFLs in the last few years has meant that many other opportunities for the use of higher efficiency lighting products have been neglected. For example, HID light sources (such as metal halide) could be a significant source of energy savings in industrial lighting and outdoor lighting.

Despite the problems enumerated above, China's Green Lights Program holds great potential for reducing energy consumption and green-house gas emission in the near future. The next stage of Green Lights initiatives should build upon the Program's initial success—great visibility and manufacturing infrastructure for high efficiency lighting products—and address more specifically the problems—poor quality and high initial cost—discovered in the initial phase of the Program.

The Green Lights effort, and follow-on work in policy development and promotion of market transformation, has benefited significantly from US and other international assistance. The American Council for an Energy Efficient Economy (ACEEE), LBNL, and other organizations have provided technical assistance, with backing from UNDP and the China Sustainable Energy Program (CSEP, funded by the Packard Foundation and managed by the Energy Foundation). GEF funding is currently being sought.

Green Refrigerators

An internationally funded, award-winning project to improve the energy efficiency of Chinese refrigerators has received approval from the government of China and international funders, and is set to start in early December 1999. The five-year program – the CFC-Free Energy-Efficient Refrigerator Project – consists of a series of market-oriented measures for manufacturers and consumers to encourage the production and consumption of CFC-free energy-efficient refrigerators. It is expected to reduce greenhouse gas emissions from China by a total of over 100 million tons of carbon dioxide from 20 million households over the 15-year lifetime of the new refrigerators. The benefits of the project will include avoided emissions of other air pollutants from power plants as well.

The refrigerator project began in 1989 when the EPA signed an agreement with the government of China to assist in the elimination of CFCs from refrigerators. The Global Environmental Facility, through the United Nations Development Program, will fund \$9.3 million of the \$40 million program to help the government of China transform its market for refrigerators. The balance of funding will come from China, mainly from ten manufacturers who will invest about \$2 million each for retooling. Major Chinese participants in the project have included the China State Environmental Protection Administration, the State Administration for Light Industry, the Household Electric Appliance Research Institute, and domestic refrigerator manufacturers. Major U.S. participants have included the EPA, the University of Maryland Center for Environmental Energy Engineering, Underwriters Laboratories, and LBNL.

Standards and Labeling

Most of China's production lines for household appliances are relatively new, and products are more efficient than in other sectors of the economy. Still, significant potential remains to improve efficiency, and standards are proving to be an effective tool in achieving that potential. SETC announced the new energy efficiency standard for refrigerators (developed by SBQTS) in September 1999. The standard will be publicly released 1 January 2000. After a period of consultation and training among manufacturers, the standard is set to be implemented on 1 June 2000. The standard includes an efficiency floor, i.e., manufacturers will not be permitted to produce models below a certain efficiency. The process of drawing up and implementing standards has taken place quickly (less than three years) in China.

The energy efficiency standard for ballasts for fluorescent lamps will be announced at the end of 1999, and go into effect in mid-2000. There are separate standards for magnetic and electronic ballasts. Magnetic ballasts were included, as it was judged not to be cost-effective to phase them out entirely from the Chinese market.

SBQTS is currently developing an efficiency standard for air conditioners. The process has been more complex than was the case for the previous two product classes owing to the large number of air conditioner manufacturers and wide disparity in technology levels. Although a period of consensus-building and education is needed, particularly to introduce new methodologies being used for standards setting (such as engineering simulation modeling), new draft standards are expected by the spring of 2000, with implementation later in the year. Standards for fluorescent lamps, clothes washers and TVs are being considered.

As mentioned above, SETC and SBQTS have established the Energy-Conserving Products Certification Commission. Its first major activity was to create an energy conservation label, similar in nature to the US Energy Star label, for refrigerators on the basis of the new refrigerator energy efficiency standard. So far, 104 refrigerator models have qualified for the label. It is expected that the label will be effective in China, as Chinese appliance manufacturers have found that energy efficiency has high marketing value.

Labeling programs are under development for compact fluorescent lamps and for conventional fluorescent lamps.

Technical assistance in formulating standards and developing labeling programs is being supported by CSEP.

Industrial Energy Use

SETC has charged the China Energy Conservation Association with the task of developing policy guidelines and regulations for meeting Article 20 of the Energy Conservation Law. This portion of the Law requires substantial improvement in industrial energy efficiency in 7200 key energy-consuming industrial facilities in China. CSEP is supporting this activity, and LBNL will provide technical support for benchmarking and possibly development of standards.

CSEP is also supporting technical consulting to a variety of Chinese government agencies on energy efficiency and renewable energy policy elements of utility regulatory reform, which China is now undertaking.

Buildings Energy Use

The Ministry of Construction (MOC) has authority over building energy efficiency standards. While no new national standards have been released over the past two years, work has proceeded on local standards, and on developing new national standards.

China already has residential building energy codes that cover urban areas in the “heating zone”, the northern section of the country where heating of buildings is permitted during the winter. MOC encouraged cities in the “transition zone” (approximately the middle third of the country, where there is significant demand for space heating in the winter and space cooling in the summer) to develop residential building efficiency standards. Chongqing developed a draft standard, with assistance from NRDC, and Shanghai and Wuhan have also been working on standards. These have been mainly based on the standards developed for the heating zone, however, and do not represent any advance. MOC recently decided to develop a unified set of standards for the transition zone, based on analytic methods more appropriate to the climate. CSEP is providing funds for Chinese experts and LBNL to give technical assistance in this area.

Canada (CIDA) is currently assisting MOC to produce national standards for commercial buildings. The standards are currently in draft form and under revision.

There are currently no initiatives to develop efficiency standards for buildings in areas south of the transition zone (e.g., Guangdong), or for buildings in rural areas.

Energy Prices

Coal

After significant new energy price reforms in 1993, real prices for coal (and other energy products) rose at a far higher rate than those for other industrial products. While coal prices continued to rise until 1997, they fell in 1998 and 1999, implying a large drop in demand compared to supply, since markets for coal are relatively free. This occurred even before the campaign in 1999 to shut down thousands of small coal mines, suggesting that the move, in part, may be intended to support coal prices by restricting supply.

Electricity

Electricity prices rose through 1998, as was the case throughout all earlier years in the decade. In 1999, however, with the abolition of hundreds of illegal fees, average power prices dropped significantly. The drop was especially pronounced in rural areas, where many layers of miscellaneous fees inflated retail rates to several times the levels charged to urban customers. In Hainan Province, electricity rates fell by half. Excess capacity in some regional grids also removed upward pressure on rates. In areas with excess capacity, utilities have begun to encourage greater use of electricity, indicating further reduced incentives to use electricity more efficiently.

Oil

Oil prices remain under state control. China’s oil price regime came under severe pressure, and eventually collapsed in early 1998, when international oil prices fell sharply. A new oil price regime was instituted in June 1998, with the domestic price pegged to Singapore, but with a one-month lag built in. Since then, domestic oil prices have been set with reference to changes in Singapore export prices, but remain significantly higher than import parity prices, leading to a need for continued vigilance against a renewed surge of smuggled oil products.

Natural Gas

Prices of natural gas are also highly controlled. The state-set price to most customers was adjusted significantly upward in 1997, and the price to some classes of consumers is in near parity with imported LNG. Heavy subsidies remain in place, however, for fertilizer manufacturers.

Government Reorganization

A major reorganization of the administrative structure of the central government took place in 1998. Restructuring along similar lines currently continues at local levels.

One outcome of this was the renaming of the State Planning Commission (SPC) as the State Development Planning Commission (SDPC). (Note that the State Power Corporation is designated “SP” to avoid confusion with SDPC’s former designation.) SDPC’s activities in energy efficiency are under the authority of the Division of Energy Conservation and Renewable Energy, within the Department of Policies and Regulations. The Division has two staff members. This is significantly smaller than in the early 1990s, when it was a Department with 30 staff. Like other departments throughout the government, which have been downsized in the past two years, there are staff from research institutes and other support units seconded to the Division to fulfill duties previously performed by SDPC staff.

SETC’s authority was widened to include control over most line ministries responsible for industrial sectors. For instance, the Ministry of Metallurgical Industry (MMI), responsible for the state’s interests in the iron and steel industry, became the Bureau of Metallurgical Industry under SETC. SETC’s activities in energy efficiency are coordinated by the Division of Energy and Materials Conservation, Department of Resources Conservation and Comprehensive Utilization. The Department has about 15 staff also down from a high of 25 or more, and the Division has two staff. Like SDPC, the Division makes use of personnel seconded from elsewhere.

The National Environmental Protection Agency (NEPA) was upgraded to half a step below the level of a ministry, and renamed the State Environmental Protection Administration (SEPA).

The State Science and Technology Commission (SSTC) was demoted to ministry level, and it has been renamed the Ministry of Science and Technology (MOST). It retains its authority over the area of R&D of energy conservation technologies, through the Energy and Transportation Division, Department of New Technology Development and Industrialization.

The State Bureau of Technical Standards was given authority over quality as well, and renamed the State Bureau of Quality and Technical Standards (SBQTS). It has responsibility for setting energy efficiency standards for a variety of products. In future, it may also become involved in energy efficiency standards for industrial processes, which in the past has been the responsibility of technical units within the former line ministries.

The Ministry of Construction (MOC) retains its authority over building codes, including energy efficiency standards for residential and commercial buildings.

Conclusion

This paper has described developments in energy efficiency policy in China over the past several years, particularly since the passage of the Energy Conservation Law (ECL) in 1997. While some progress has been made in developing sectoral and regional implementing regulations, there has been relatively little new activity stemming from the ECL. As in the past, a variety of directives have been issued regarding particular targets for energy efficiency improvements, e.g., closure of small, inefficient energy-consuming facilities. One of the most significant areas of activity has been the growing momentum for development and application of energy efficiency standards for appliances, and initiation of labeling programs. The Tenth Five-Year Plan (2001-2005) is currently being formulated, and, in energy-efficiency policy as in other areas, it is expected to set out a role for government that relies more heavily on regulation of market forces than the command-and-control mechanisms favored in previous plans. The retreat from direct government involvement in implementing energy efficiency is evident in the diminishing role of CECIC, and in the emphasis on organizations like EMCs in arranging and carrying out projects. At the same time, the Green Lights and Green Refrigerators projects have introduced the concept of comprehensive market transformation in the promotion of energy efficiency, extending traditional technology-focused efforts to

consumers, dealers, and other stakeholders. In both cases, international assistance has been key to the transfer of these approaches to China. Major areas of opportunity for greater energy efficiency lie in the industrial and buildings sector, but they remain difficult to reach. Freeing of energy prices caused them to rise significantly, giving a large, one-time boost to incentives for energy efficiency in industry and buildings, as well as other sectors. Over the long-term, more widespread market pricing of energy products appears to favor efficiency, but fluctuations in prices mean that this effect cannot be relied on entirely, once again highlighting the need for continued public-sector attention.

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Appendix 1

Fund created to finance environmental projects

Date: 11/14/1999

Author: Meng Yan

Document Source: *China Daily*

An industrial investment fund is being created to assist the energy conservation and environmental protection industry in China. Eighty per cent of the available funds are expected to be invested in high-tech projects in the environmental industry, according to a spokesman with the fund. It will represent the largest-ever private investment in the industry, said the spokesman.

The fund is expected to inject new vitality into China's rapidly growing energy conservation and environmental protection industry, he said. New products with a high technological content, great market potential and promise of high returns to investment have emerged in China's energy conservation and environmental protection industry in recent years. But individual enterprises shrink from investing in an industry that often depends on government budgets for capital and operating funds.

This may be partly explained by the fact that projects in this industry often require a large amount of one-time investments in research and development and for the installation of equipment. Investors sometimes have to wait a long time before they see returns. Add to all this the inherently high risks involved in investing in high-tech enterprises.

Governments at all levels have a limited amount of money to spend on these types of projects. With construction a priority of the governments, energy conservation and environmental protection industries in China are plagued by a shortage of capital. This, coupled with inefficiencies that occur in government-run enterprises, greatly hinders development of the industry.

Industrial investment funds, with large amounts of capital and professional management, can well counter the negative aspects of the potentially profitable industry. The risk-avoidance behaviour of industrial investment funds makes them suitable for high-tech ventures in the energy conservation and environmental protection industry.

The fund, co-sponsored by the China Energy Conservation Investment Co, CITIC Development Co Ltd, Haitong Securities Co Ltd and Liaoning Energy Co, will be privately placed. The four sponsoring companies recently signed in Beijing an agreement of intent to provide funding. It will be managed by a professional firm to ensure its long-term increase in value, according to the four sponsors. A modern fund management system, conforming to international practices, will be adopted to achieve safety, flexibility and profitability, said the spokesman.

The fund will begin operating as soon as the Temporary Regulation on Industrial Investment Funds is made available, according to the spokesman with the fund. Experts expect the regulation to be announced before the close of this year. The regulation will give a boost to the role of the market in fund management and will be of use in helping fend off unwarranted government interference.