

Green Labeling and Energy Efficiency in China

By Gary McNeil and David Hathaway

Worldwide, “green labels” work to reduce environmental degradation by helping consumers make more informed choices about the products they buy. Amidst a growing number of green labels in China, one of the most well developed is an energy efficiency green label program managed by the Certification Center for Energy Conservation Products (CECP). The CECP label (See Figure 1) identifies products with superior energy efficiency—those products that perform the same work while using less electricity. Chinese product manufacturers voluntarily decide to use the label since the label enhances the attractiveness of their products in the Chinese consumer marketplace.

Figure 1. CECP Label



The environmental impacts of electricity generation are well known, and make a compelling case for energy efficiency labeling. In China and the United States most of the electricity supply is generated by the combustion of fossil fuels, primarily coal. The environmental consequences of coal burning are very serious:

each kilowatt-hour produces approximately a kilogram of carbon dioxide, and coal-fired electricity generating facilities also emit substantial amounts of air pollutants such as sulfur dioxide, oxides of nitrogen, mercury, and particulates.

Manufacturers and Consumers in China Embrace the Energy Efficiency Label

When developing a recent promotional campaign for CECP-labeled products, CECP hired a Beijing-based advertising firm to conduct market research to better understand the concerns of potential refrigerator purchasers. CECP found that 68 percent of consumers felt that a label indicating “authoritative (e.g., state) certification” was the most compelling when selecting an energy-efficient product. In another study, the majority (54 percent) of those surveyed indicated that they first looked to an authoritative product label when they made a refrigerator purchasing decision, while personal

information from others, product manuals, and evaluations from manufacturer associations ranked lower in importance.

Interestingly, the CECP survey revealed that the Chinese consumers are confronted by an overload of certifications and claims that they felt they could not trust. Products often included claims and information from organizations that were unfamiliar to consumers. Based on these results, CECP decided to stress its state-authorized certification authority in campaign messages. For example, to emphasize these ideas, it developed a new label tagline: *Superior Energy Efficiency, Authorized Certification (Gaoxiao jieneng, quanwei renzheng)*. CECP’s experience suggests that government-backed green labeling programs, or those with similar state authority such as CECP’s program, may have the most potential to influence the behavior of Chinese consumers.

Labeling Will Help China Meet Growing Energy Demand

As the widespread brownouts along China’s east coast in the summer of 2004 demonstrated, China is an energy-starved nation. Thus, measures to improve energy efficiency of appliances, office equipment, computers, consumer electronics, and other electrical products are particularly important in China. Ownership of these products is increasing rapidly. For example, as of 2002, 87 percent of urban households owned refrigerators, and an even larger share owned washing machines (93 percent) and televisions (126 percent).¹ Rural appliance ownership is also growing rapidly, and China leads the world in the manufacturing of many key appliances. Electricity consumption is growing faster than other major energy uses—increasing an average 14 percent annually from 1980 to 2003.²

To address this challenge and opportunity, CECP was established in 1998, and in 1999 issued energy efficiency performance specifications for refrigerators, the first products eligible for the CECP label. Refrigerators with superior energy efficiency—defined as using 25 percent less electricity than allowed by mandatory energy efficiency standards—were eligible to display the CECP label.³ The U.S. Environmental Protection Agency (EPA) believes that the CECP label can foster efficiency improvements that will save at least 58 million tons of carbon dioxide, along with millions of tons of pollution that is degrading the air of Chinese cities.

China and the United States Start Working Together on Green Labeling

In late 1999, CECP's director, Mr. Li Tienan, proposed that CECP cooperate with ENERGY STAR, a U.S. energy efficiency labeling program managed by the Department of Energy and the EPA. The partnership was built on two key factors. First, as the largest and longest-running national voluntary energy efficiency labeling program in the world, ENERGY STAR offered potentially useful lessons for an equally ambitious program in China. Second, the U.S. EPA had a successful history of working with Chinese partners on promoting energy efficiency in consumer products.⁴

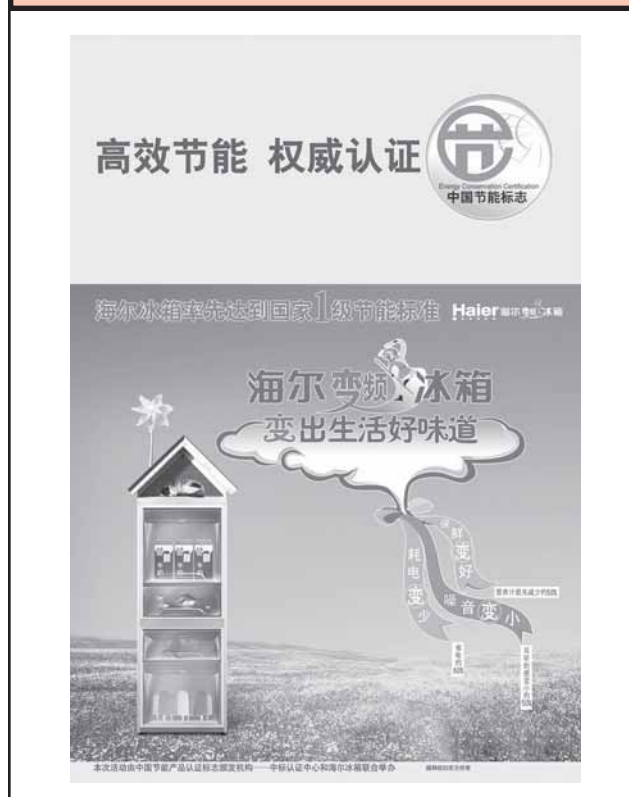
One example of the CECP-EPA collaboration is CECP's adoption of ENERGY STAR performance levels in printers (in 2003) and color televisions (in 2002), which represented two new products that CECP targeted for labeling. This collaboration helps both programs, because manufacturers who sell products in both countries can more easily qualify their products for both labels. In addition, during the refrigerator promotional campaign, CECP worked closely with EPA to strengthen its product promotion activities, drawing on the successful experience of ENERGY STAR. CECP has based its consumer research strategy on ENERGY STAR methods, using a combination of market research, focus groups, and other tactics to develop an effective product promotion. The refrigerator campaign was launched in November 2003 in conjunction with China's national Energy Week. CECP worked directly with Haier—China's largest refrigerator manufacturer—to promote labeled refrigerators in over 90 stores in 18 cities in China. (See Figure 2. Haier-CECP promotional advertisement).

China Leadership in Asia

Based on the success of CECP, Li Tienan has become a leader of efforts to promote wider use of energy efficiency labels in Asia. In 2003, he addressed regional meetings in Bangladesh and Australia, sharing CECP's experience with officials from Australia, Bangladesh, Bhutan, Chile, India, Japan, the Maldives, Mexico, Nepal, New Zealand, South Korea, Russia, Sri Lanka and Taiwan. Several of these nations are planning a study tour in China to learn how CECP established its program.

CECP has also been selected to manage the next phase of the Efficient Lighting Initiative (ELI), a Global Environment Facility sponsored program for lighting products that began in seven countries including Argentina, Czech Republic, Hungary, Latvia, Peru, Philippines, and South Africa.

Figure 2. Haier-CECP Advertisement



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ENDNOTES

¹ National Bureau of Statistics, *China Statistical Yearbook 2003*. Beijing: Statistical Press, 2003.

² National Bureau of Statistics, *China Statistical Yearbook 2003*. Beijing: Statistical Press, 2003; *Zhongguo Dianli Bao (China Electricity)*, cited in *China Energy Report Weekly*, Vol. 3, Issue 4, 17 January 2004.

³ The specification has since been strengthened to require that a refrigerator be 35% more efficient than the minimum mandatory standard (China Energy Conservation Products Management Committee, *Technical Specifications for Energy Conservation Product Certification for Household Refrigerators*, CCEC/T01-2001, 1 May 2001).

⁴ Case study articles on prior EPA collaboration on energy efficiency in China can be found at:

<http://www.usctcgateway.net/casestudies/CasestudiesDetail.cfm?LinkAdvID=34579>

<http://www.usctcgateway.net/casestudies/CasestudiesDetail.cfm?LinkAdvID=34339>

Addressing Urgent Needs: The Emergence of Environmental Education in China

By Jing Lin and Heidi Ross

Since 1996 we have conducted educational fieldwork in numerous schools across China. Our initial involvement in environmental education emerged from observing changing school landscapes where we worked—Chinese schools have not been immune to the impacts of pollution and natural resource degradation. Sometimes on early Beijing mornings, through the heavily dusted sky, the sun hung so dull and so faint over school playing fields that we could stare into it without hurting our eyes. Floodwaters—caused in great part by upstream deforestation—periodically swamped our field sites in southwestern and southern China. Shanghai campuses were murky with exhaust and discharge when we visited in the 1990s and only recently have begun to clear up. Across China, we have encountered more and more small but vocal groups of educators who have begun to speak passionately about the relationship between human welfare, sustainable development, and the schools' responsibility to nurture citizens with ecological consciousness.

Increased environmental awareness among teachers and administrators, in tandem with recent school reform trends (expansion, de-politicization, individualization, and increasing inequality of educational opportunities), reflects a significant post-socialist shift in the purpose, content, and outcomes of Chinese schooling. The emergence of environmental education, which is now a national mandate in all schools, is a significant dimension of change in Chinese education. Although environmental education is at the beginning stage of development, its long-term potential deserves careful study and reflection, for it is sparking intriguing changes in the educational system. Moreover, effective environmental education will be crucial in pushing China onto a sustainable development path.

Five Reform Trends Shaping Environmental Education in China

Over the last decade as the Chinese education system has undergone massive reform, environmental education

has emerged as a new priority. In 1992, the first environmental education conference was held in China. Prior to the conference, environmental education had generally been restricted to biology classes, in which students were cautioned not to eat polluted seafood or swim in polluted rivers and lakes. By the mid-1990s, growing news media attention to, and public debate about, the rapid deterioration of China's air, water, and land galvanized state, education, and nongovernmental leaders to discuss how comprehensive environmental education could be integrated into the school curriculum. In 2003, the Ministry of Education published new guidelines, written in collaboration with WWF-China, requiring that environmental knowledge, attitudes, and values be integrated into the compulsory school curriculum. These guidelines, described by the Ministry of Education as central to "the nation's sustainable growth strategy," have been deemed so potentially significant to the global community that they have received the WWF-China's "Gift to the Earth" award (Fang, 2003).

Five environmental reform trends were central in shaping these guidelines: (1) expansion and commercialization of post-secondary schooling, (2) inclusion of environmental training and study in teacher education programs and research institutions, (3) development of "integrated" textbooks and teaching, (4) emergence of environmental nongovernmental organization (NGO) activism, and (5) establishment of state-supported "green schools."

1. The expansion and commercialization of higher education. Environmental education first entered formal schooling in China, as it has worldwide, at the tertiary level. Recognition of the economic costs of pollution, as well as the need to cultivate a cadre of researchers and teachers in environmental science, provided the impetus for China's first environmental studies programs in the late 1970s and early 1980s. Departments, programs, and centers of environmental studies at tertiary institutions have rapidly expanded since the mid-1990s. This

expansion is due in great part to researchers and academic leaders, now responsible for generating much of their own funding, using environmental studies as a vehicle for revising, re-tooling, and expanding engineering and other physical and earth science programs that had begun to lack student appeal as China's colleges and universities diversified and expanded. In short, academics have found in environmental studies programs a new niche from which to attract students and funding. Significantly in

content learning and methodological approaches. This trend will accelerate as colleges and universities respond to multiple pressures from the state, the market, the public, and an increasingly global higher education discourse of competition—symbolized by recent WTO-inspired legislation in China to allow international firms and institutions to operate schools in China—to reform curricula and educate students for a knowledge and service-based economy.

The emergence of environmental education, which is now a national mandate in all schools, is a significant dimension of change in Chinese education.

the past few years as government policies and five-year plans have increasingly prioritized environmental protection to guarantee economic development, establishing programs of studies in environmental protection has become a trend in all major universities.

2. The inclusion of environmental training and studies in teacher education programs and research institutes. Central government pronouncements to include “entrepreneurial and market principles” within higher education have changed the nature of teacher education in China significantly. Although normal colleges and universities still train the majority of teachers, comprehensive universities are now also encouraged to establish teacher-training programs. Normal universities are responding to this competition with more specialized and flexible training options, such as setting up environmental studies centers for physical and earth science majors. For example, WWF-China's Environmental Educators' Initiative, begun in 1997, supports mainstreaming environmental education in Chinese schools through enhanced teacher education and the preparation of environmental education training manuals and model lessons for grades 1-9. Phase one of the project involved the establishment of Environmental Education Training Centers in Beijing Normal University, East China Normal University in Shanghai, and South West China Normal University in Chongqing. Teachers trained in these centers have acted as members of Ministry of Education teams producing national guidelines for environmental education. Research institutes, such as the Beijing Educational Science Research Academy, also have set up environmental centers to conduct research and implement programs funded by international organizations. Our survey of teacher education programs suggests that teacher educators are gradually incorporating environmental education into their training of prospective teachers, both in terms of

3. The writing and publication of “integrated” textbooks. From 2000-2003 the Ministry of Education's Curriculum Research Center has been testing, revising, and publishing a new national series of nine-year compulsory education textbooks, which for the first time includes teaching guidelines and learning standards that are written from an integrated, interdisciplinary perspective for secondary school science students—rather than focused upon knowledge and skills of discrete subject areas. Chinese and international educators alike stress that integrated curricula are a necessary structure for teaching environmental studies. Currently, the schools in Beijing and other cities testing the new textbooks are attempting to integrate environmental education into all subject areas, especially science, language, and biology. Schools also have received guidelines regarding how they can connect textbook contents to raising students' environmental awareness and helping students gain knowledge about environmental protection. Gradually, these revised textbooks will be used in schools throughout the country.

4. The influence of NGOs on environmental education. Since the mid-1990s, China's environmental NGOs have emerged as a new form of social organization that is influencing educational policy and practice. Because of their diverse constituencies and broad missions—ranging from increasing women's involvement in environmental protection to raising environmental awareness among children, and to using the news media to promote public understanding of environmental laws—China's green NGOs are shaping the direction of environmental education in many ways. First, and perhaps most importantly, Chinese environmental NGOs concretely convey the message that public matters (such as guaranteeing clean water) are no longer just a government responsibility, and they are providing professional

educators and schools with a new venue for facilitating school-family linkages on behalf of the environment. One example of this possibility, discussed in greater detail below, is the institution of green school designations for schools, whose environmental awareness programs move beyond the formal school curriculum and help students and their families think about environmental challenges in their local communities. People's Education Publisher and WWF-China also have established a web site to publicize laws relating to environmental protection, and to assist teachers and students across China share their ideas, reflections, and work.

Although registering an NGO is difficult, since the mid-1990s, more and more individuals—many of whom are teachers or university professors—have been setting up NGOs that attempt to spread information about the importance of environmental protection and sustainable development. For example, China's first environmental NGO, Friends of Nature (FON, founded by a renowned history professor Liang Congjie), is giving advice and funding to university green groups in Beijing on setting up environmental education programs in migrant schools. With support from a German foundation, FON has created a Tibetan Antelope Mobile, which brings environmental education materials and activities to poor rural schools.

The number of universities with student-organized green associations has similarly exploded since the mid-1990s (Lu, 2003). Almost all of these green student groups create environmental education initiatives to raise awareness of pollution and threats to nature both on and off campuses. The green activities of Chinese NGO and student groups are frequently reported in the journal *Environmental Education (Huanjing Jiaoyu)*, which has played a pivotal role in China's environmental education development. The journal not only publicizes state environmental policy, but also provides schools and environmental educators a forum for exchange of successful programs and activities and experiences.

5. State Establishment of "Green Schools." In December 1996, China's National Environmental Protection General Bureau (Now State Environmental Protection Administration or SEPA) and the former National Commission on Education (now Ministry of Education) jointly issued a policy statement, *An Outline for National Environmental Education Actions*.¹ The *Outline* stipulated that by the year 2000 "green schools" would be promoted throughout the country and schools meeting general criteria for a "green" curriculum, administration, way of

living and environment would receive green school certification. The green school model emphasizes the integration of hands-on, research-based interdisciplinary environmental content and learning activities, as well as the creation, by proactive administrators and teachers working in collaboration with communities, of independent courses on environmental education. By October 2000, 16 provinces participated in the creation of 3,207 green schools, which by 2001 grew to 4,235.

The introduction of green schools is part of a broader policy supporting the "diversification" of secondary schools to better meet the needs of the diverse interests and economic conditions of local communities. Some green schools appear to be reconverted agricultural schools for rural children (which are often of very low status), suggesting that concern for the environment can be capitalized upon by schools struggling to provide students (and their parents) relevant and credible education. Other green schools are materially rich suburban and urban institutions desirous of the cachet of the green label.

Significant obstacles prevent schools from fully implementing the green school concept, including lack of funding. However, the greatest barriers are non-material, for instance:

- The indifference of or resistance to environmental education on the part of professional educators. Many school leaders perceive environmental education as being yet another redundant mandate imposed from above.
- The lack of understanding regarding the importance and need for environmental protection and sustainability leads to superficial implementation of environmental education, which many school leaders take to mean the planting of more trees or creating a green lawn on campus.
- The absence of pre-service and in-service teacher training in environmental education also hinders the creation of effective programs. While prominent teacher education institutions like Beijing Normal University have active environmental education centers, no systematic training program exists to inform teachers of relevant laws and theories regarding environmental protection and sustainability.

This latter issue of teacher training stands as a major challenge to all Chinese schools trying to "green" their curriculum. Although over 86 percent of 489 teachers participating in a 2001 survey of environmental

knowledge rated environmental education as very important, only 30 percent of the respondents could suggest how they might relate environmental content to the subjects they taught. Only 16 percent evidenced a clear understanding of the concepts of environmental education (Lin, 2001). Teachers in the study who taught environmental content did so by adopting *ad hoc* approaches based on their own interest and enthusiasm. Notably, many secondary school teachers are reluctant to accept the burden of squeezing into their class schedules “another subject” when they are rewarded primarily for their students’ achievement on high stakes examinations, the contents of which do not yet include substantial environmental education knowledge. The pressures placed on secondary school teachers, often by parents, to “measure up effectively” (e.g., produce high test scores) ensures that environmental education in many schools is just “for show.”

Educational Innovation Through Environmental Education

Despite these challenges, environmental education has great potential for supporting educational reform and teaching innovation in China. A perennial criticism of Chinese schooling, particularly at the secondary level is that it is rigidly remote from practice and cultivates students who know how to study but not with a sense of social responsibility. In contrast, schools active in implementing environmental education have demonstrated that their programs provide opportunities to break away from the traditional mode of rote education and become creative and innovative. Their inquiry-based, student-centered, and experiential learning approaches are precisely the teaching methods promoted by China’s ongoing nationwide curricular reform process.

For example, students in many green schools form their own environmental protection clubs, design “case study” projects for studying local water and air pollution or other urgent problems in the local community. Students involved in such projects are active researchers gathering and synthesizing data and working collaboratively with community leaders to solve local problems. According to supportive teachers, such activities link academic work and advocacy, and stimulate in students a sense of responsibility and awareness of their roles as global citizens. Finally, teachers we have interviewed in one dynamic green school maintain that because students’ diverse abilities and interests anchor the educational process, new teacher-student relationships and student-teacher roles result. Teachers become facilitators of learning rather than authority figures.

The Ministry of Education’s 2003 *Educational Outline for Making Environmental Education a Special Subject* directed all bureaus of education and schools, starting in the spring of 2003, to: (1) offer courses on environmental education as an independent subject; (2) fully integrate environmental education into school schedules; (3) offer teacher training; and (4) conduct research on environmental education pedagogies. This directive also stressed that environmental education should enhance student sensitivity for environmental issues through active learning by focusing on current debates such as the impact of automobiles on the environment and comparative studies of environmental quality within China and between China and other nations. If this new outline could be fully implemented, the potential for significant reform of teaching and learning would be great indeed.

Reflecting on our insights from seven years of interviews and studies of China’s educational system, we are cautiously optimistic that Chinese schools will rise to the challenge of incorporating environmental education into their curriculum. Moreover, such programs will promote greater interdisciplinary education, something sorely lacking in Chinese schools. Chinese schools will strengthen such “green” classes and programs, for there are both top-down and bottom-up forces, within China and transnationally, advocating for stronger environmental education.

Top-down Impacts: Central government policy has directed schools to adopt environmental education textbooks and curricula. As noted above, People’s Education Publisher has responded by creating and testing such curricula in select primary and secondary schools. Environmental education is also highlighted in advanced professional training. For example, Chinese University of Political Science, the State College of Judges, and the All China Lawyers Association recently sponsored a third national class on environmental law. The decentralization, diversification and rapid expansion of higher education in China indirectly inspire creative developments in university-level environmental education, in part as a way to attract students. Centrally mandated reporting on China’s environmental quality also has greatly expanded environmental education in newspapers and television, which in turn sparks interest in and demand for such knowledge by students and teachers. SEPA programs largely carried out through GONGOs and research institutes are providing environmental education materials (books and videos) to schools. Furthermore, bilateral agreements between China and the U.S. have supported

the inclusion of environmental education in the school curriculum through projects such as the international GLOBE program that links high school students worldwide to discuss their countries' environmental challenges, and the Chinese Environmental Global Alliance (CEGA), which supports the translation of U.S. environmental education textbooks for use in Chinese schools.

Bottom-up Impacts: As we have noted above, NGOs, such as WWF-China, are providing key support for many activities promoted by the central government, particularly in the area of curriculum development. Likewise, formal education institutions, from the primary to the tertiary level, are joining forces with community organizations and research institutions in umbrella organizations such as the China Environmental Education Network. University student groups, such as the Shanghai Tongji University Green Path and the Shanghai University of International Studies Green Window advocate among their peers for environmental awareness. Furthermore, newly piloted environmental education textbooks and school-based projects highlighted through the China Environmental Education Network indicate that environmental education enables schools to stretch the boundaries of appropriate school knowledge, promoting more general education reform in the direction of multi-disciplinarity. Demands by educators and communities for environmental education also have arisen as a result of local activism and NGOs working outside the formal school sector (Zeng, 2001).

Finally, transnational NGOs and educational institutions in the United States and other countries have established ongoing environmental education exchanges with Chinese institutions through one-to-one exchanges, through organizations such as the Global Environmental Educators Initiative, and through symposia and forums, such as a recent Beijing meeting on cooperation between environmental NGOs in China and international NGOs. Many such transnational initiatives have the explicit aim of promoting environmental awareness as a form of civic participation in China. We believe that this aim is one-sided. Our research convinces us that Chinese educators' approaches to environmental education have much to offer the global environmental education community. One fruitful area of collaboration toward this end will involve careful evaluation of Chinese philosophical traditions that privilege harmony, sustainable relationships with nature, and trans-generational communication and support.

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ENDNOTES

- ¹ An "outline" implies no legal mandate. Rather, such policy statements and instruments serve to introduce and publicize through schools and other social institutions goals the state deems desirable for discussion, experimentation, and implementation. In China many government policies are announced in the form of "outlines." Given the relatively centralized nature of policy development in China, such "outlines," while not carrying the force of the law, are duly adopted and carried out.