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**The Barriers to Energy Efficiency in China: Assessing  
Household Electricity Savings and Consumer Behavior in  
Liaoning Province**

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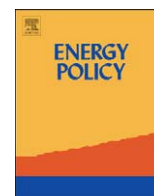
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# The barriers to energy efficiency in China: Assessing household electricity savings and consumer behavior in Liaoning Province

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## ABSTRACT

This article investigates the barriers to energy efficiency at the residential sector within one province in China and explores patterns of household electricity consumption. The article presents the results of a survey questionnaire distributed to more than 600 households in Liaoning Province, field research at various Liaoning government agencies, and research interviews of Liaoning government officials to determine the efficacy of their energy efficiency efforts in China. It then investigates the extent that electricity consumers have taken advantage of energy efficiency opportunities relating to more efficient lights, water heaters, appliances, air-conditioners and heaters, and better energy-efficiency labels. The article also assesses the degree that electricity users have become more aware about electricity prices and their levels of consumption, and touches on the connection between rising levels of income and electricity use. It concludes by providing recommendations for how to improve efforts to promote conservation and reduce electricity load growth in Liaoning Province and beyond.

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## 1. Introduction

Like many countries in the developing world, China faces a series of fundamental dilemmas related to energy and electricity use. Growing consumption of energy fuels and services bolsters the Chinese economy, but also exposes it to volatile prices and potential disruptions in supply. Providing electricity to rural villages alleviates energy poverty, but can also exacerbate environmental degradation and climate change (Sovacool and Vu, 2010). From 2005 to 2009, the average price of retail electricity more than doubled in China, and for some particular regions, the National Development and Reform Commission (NDRC) has increased electricity prices from the equivalent of US 1.7 cents/kWh to more than US 4 cents/kWh. Numerous studies have also calculated that China has so far harnessed only a minuscule portion of its immense energy efficiency potential (Min et al., 1997; Gielen and Chen, 2001; Price et al., 2002; Crompton and Wu, 2005; He et al., 2006; Lu, 2006, 2007; Yang, 2008; Li and Colombier, 2009; Speed, 2009).

The energy policy and energy efficiency challenges are particularly stark for many individual provinces within China. In December 2007 and January 2008, for example, 17 provinces in

announced shortfalls in electricity supply due to a combination of rapidly rising industrial demand for electricity, severe weather, interruptions in shipments of coal, and the rising price of crude oil. Many of these provinces curtailed electricity use by initiating rolling brownouts with grave consequences for economic development. One such energy-challenged province is Liaoning, home to 14.6 million households and 43 million people. In this province, peak demand for electricity was 1.5 million kWh greater than existing electricity supply in 2007, and electricity demand is expected to continue to grow further.

To account for this “gap” between electricity supply and demand, the provincial government in Liaoning has initiated a series of energy efficiency programs and practices with the aim of reducing household electricity use by at least 2 million kWh by 2010. These programs have promoted more efficient lights, improved water heaters, efficient appliances, better performing space heating and cooling devices, and energy efficiency labels as ways to reduce consumer demand for electricity. Government officials hope that these policies will result in considerable household energy savings that can avert future electricity shortfalls, avoid the need to build additional power plants, and improve the reliability of the electricity grid.

This article relies on a survey questionnaire distributed to more than 600 households in Liaoning Province, field research at various Liaoning government agencies, and research interviews of Liaoning government officials to determine the efficacy of their energy efficiency efforts. More specifically, the article explores

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current patterns of electricity consumption and consumer behavior in Liaoning Province at the household level. It then investigates the extent that electricity consumers have taken advantage of energy efficiency opportunities relating to more efficient lights, water heaters, appliances, air-conditioners and heaters, and better energy-efficiency labels. The article also assesses the degree that electricity users have become more aware about electricity prices and their levels of consumption. It concludes by providing recommendations for how to improve efforts to promote conservation and reduce electricity load growth in Liaoning Province and beyond.

Our study differs from previous scholarship on energy efficiency and consumer behavior in four ways.

First, a healthy collection of the energy policy literature has explored the behavioral aspects of energy and electricity use as well as detailed the barriers to energy efficiency and demand side management programs. For a small sample of this vast literature see Stern (1986, 1993), Lutzenhiser (1992), Kempton and Schipper (1994), Kempton and Layne (1994), and Wilhite et al. (2000) for an assessment of the behavioral dimensions of energy use, and Brown (1993), Jaffe and Stavins (1994), Brown (2001), and Bjornstad and Brown (2004) for an analysis of the barriers to energy efficiency. Although these studies (and the hundreds of others not mentioned) are useful, they have tended almost exclusively to look at behavioral patterns of energy consumption and barriers in the United States, Europe, and other industrialized countries. Much less work has been done on the patterns and barriers in developing countries such as China and India. This study is an attempt to help fill that gap by focusing on the patterns and barriers in Liaoning Province.

Second, many scholars and analysts continue to approach the issue of energy policy and China at the national scale. Our study looks at the sub-national level to explore the challenges facing Chinese provinces and, within this province, the dilemmas and issues at the household and individual scale.

Third, our study provides the first evaluation (that we know of) examining the effectiveness of various efforts within China to promote energy efficiency. Among these include the Chinese Ministry of Finance and NDRC's Energy-Efficient Illuminating Project, which subsidizes 13 different types of high-performance lighting systems to make them more affordable for consumers; a national energy efficiency labeling and product identification program; additional Liaoning Provincial Government discounts, rebates, and labels for energy-efficient appliances; and Chinese State Environmental Protection Administration (SEPA) standards for solar water heaters. Our work in Liaoning Province offers a useful lens examining the degree to which these programs are actually saving electricity and changing attitudes in practice.

Fourth and lastly, our study had the benefit of relying on a research team composed of native Chinese speakers. These researchers could translate Chinese documents and speak to ordinary consumers and government officials without an interpreter. Rather than relying only on a review of the literature our study therefore utilizes data from a series of extensive surveys distributed to rural and urban Chinese residents that only speak Chinese.

## 2. Research methods

In addition to a review of the Chinese and English literature on electricity use and energy efficiency in Liaoning Province, our study relied on three primary methodological tools: field research, a research survey questionnaire, and research interviews.

First, the study drew from field research at selected Liaoning government agencies to get a basic understanding of the

Province's electricity challenges. One of the authors spent 6 weeks on assignment at two key government agencies: the Bureau of Resource Conservation (part of the Development and Reform Commission of Liaoning Province), and the Bureau of Energy (part of the Economic Commission of Liaoning Province). These two agencies were selected based on their role in the Liaoning electricity sector. The Bureau of Resource Conservation is charged with planning and implementing energy conservation and energy efficiency programs. The Bureau of Energy oversees manages the market reforms currently underway as the Chinese energy sector transitions from a planned economy to a socialist market economy.

Second, the study distributed a research survey questionnaire in Mandarin to more than 600 households in 14 cities within Liaoning Province. The questionnaire covered four main areas: patterns of household electricity consumption; possession of household appliances; awareness of electricity saving; and demographic information about the respondents. A template of the survey, translated into English, is presented in Appendix A.

In total, 682 questionnaires were delivered to the cities of Shenyang, Dalian, Anshan, Fusun, Benxi, Dandong, Jinzhou, Yingkou, Fuxin, Liaoyang, Panjin, and Huludao in December 2008, and 615 were collected for analysis (for a response rate above 90 percent). This response rate is unusually high, but it is perhaps explained by the fact that one of the authors personally supervised survey distribution and collection in two of the cities and relied on assistance from government survey conductors for the remaining cities.

The authors supplemented survey distribution and collection with two other field visits in December 2008. The first was to Huanggu District and Shenyang City to ascertain how urban

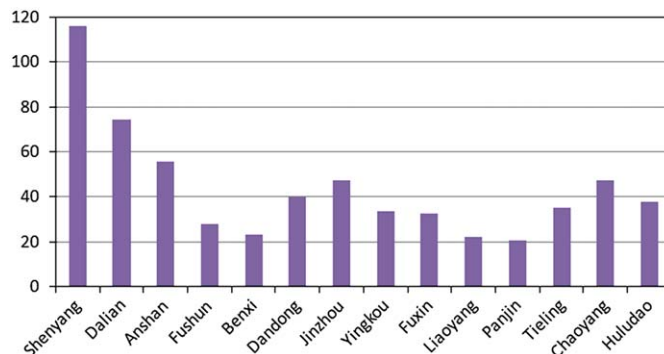


Fig. 1. Research questionnaire distribution by sub-province and city.

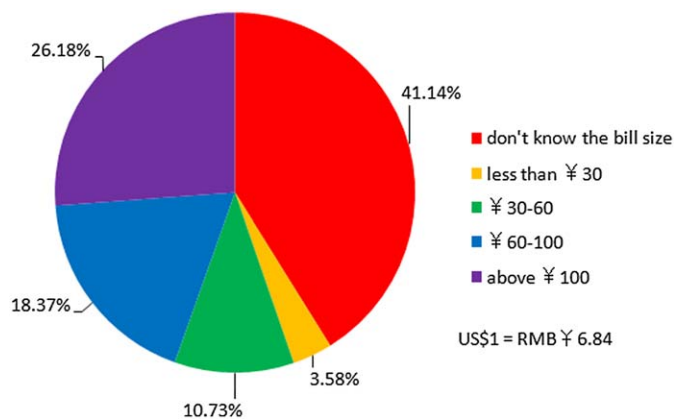


Fig. 2. Research questionnaire distribution by size of monthly electricity bill.

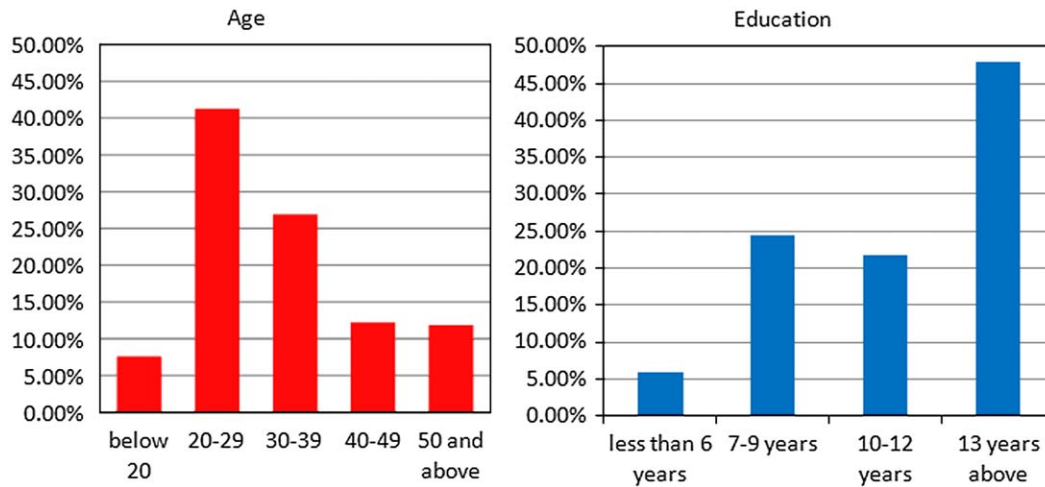


Fig. 3. Age and education profile of respondents.

households used electricity and appliances; the second was to Heiyupao village to determine patterns of rural consumption and knowledge about electricity.

The demographic information collected with the surveys suggests good distribution and representation based on urbanization, region, income, age, and education, although there are some sample biases. Fifty-nine percent of questionnaires were completed by respondents that considered themselves “urban” whereas 41 percent considered themselves “rural.” Fig. 1 shows that every city had at least 20 respondents. Fig. 2 depicts that respondents had a diverse array of monthly electricity bills and levels of electricity consumption. Fig. 3 documents that no single age group or level of education dominated among the respondents. However, compared with the overall population in Liaoning, a few biases exist. Survey participants tended to be from younger families, and since those types of households typically have higher than average energy appetites, they could partially skew results. Also, participants from five areas (Shenyang, Dalian, Anshan, Jinzhou, and Chaoyang) accounted for more than half (about 55 percent) of completed questionnaires, meaning results could be biased slightly by location.

Third, after the completion of field research and distribution of the research survey, four two-hour research interviews were conducted with stakeholders including relevant government officials and heads of the community. The purpose of these interviews was to confirm which policies were most effective at reducing household electricity use and also determine how to improve existing energy efficiency programs. One respondent was the vice-director of an energy-saving department in the provincial government; two were deputy heads of different districts within the province; and one was the head of a local community.

### 3. Results and discussion

This section presents the results from our field research, survey, and research interviews. It divides the discussion into seven areas. The first two, trends in household electricity consumption and overall consumer awareness, explore some of the fundamental aspects of electricity use and knowledge in Liaoning Province. The final five sections discuss trends relating to lighting and illumination, water heating, appliances, space heating and cooling, and energy efficiency labels.

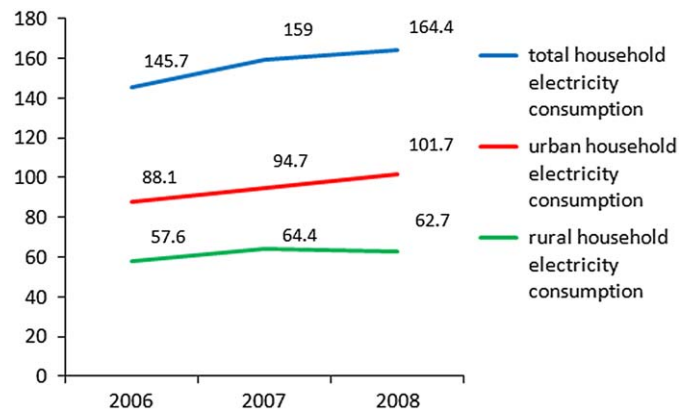


Fig. 4. Electricity consumption in Liaoning Province from 2006 to 2008 (million kWh).

#### 3.1. Household electricity consumption

Between 2006 and 2008, household electricity demand grew at an average rate of 6.2 percent each year in Liaoning Province, with significant growth occurring in urban locations and a total load of 164.4 million kWh in 2008 (see Fig. 4). Should this pattern of growth be sustained, the demand for household electricity will double in the next 11.5 years. Rather than treating household demand for electricity as a given, however, it is useful to disaggregate it into different energy services and uses. Four main streams of electricity usage dominate household consumption in Liaoning Province: lighting, cooling, heating, and household appliances. Table 1 breaks these down for a typical middle class household within the Province. As Table 1 describes, the average household has two wall-mounted air-conditioners, two fans, an electric water heater, nine lights and lamps, two televisions, a laptop computer, one refrigerator, and a variety of other appliances.

The average size of this household is four persons, living in an apartment of about 80 m<sup>2</sup> with three bedrooms, one living room, one kitchen, and one bathroom. In addition, the average monthly household income is above ¥9000 and the typical monthly electricity bill ¥112.58. Unlike the United States and Europe, electricity use is pre-paid, meaning someone spends an average of 10 min every month walking to the payment office to pay the bill to avoid the balance becoming zero and the power being automatically cut off. Also unlike many industrialized countries,

**Table 1**  
Typical household electricity consumption for a Chinese home in Liaoning Province.

Lighting		Cooling	
Energy-saving circline lamp	1 32 W	Air-conditioner	1 1600 W
Energy-saving circline lamp	1 22 W	Air-conditioner	1 815 W
Energy-saving U bent lamp	2 18 W	Fan	1 60 W
Compact fluorescent bulb	2 32 W	Fan	1 45 W
Fluorescent lamp	3 30 W		
<b>Heating</b>			
Electric heater	1 2200 W	Fan for heating	1 1200 W
Water heater	1 1200 W	Bathroom heater	1 1100 W
<b>Household appliances</b>			
TV set	1 150 W	PC	1 250 W
TV set	1 255 W	Laptop	1 300 W
Cooker	1 600 W	Vacuum cleaner	1 1400 W
Micro-oven	1 800 W	Washing machine	1 200 W
Range hood	1 250 W	Induction cooker	1 2100 W
Water dispenser	1 500 W	Refrigerator	1 0.77 kWh/24 h

electricity prices are comparatively low at about US 4 cents/kWh, creating less of an incentive to conserve electricity and perhaps counteracting energy efficiency efforts. Rough calculations suggest that most energy is consumed by household appliances, followed by cooling and heating, with illumination consuming the least amount of electricity.

### 3.2. Overall consumer awareness

Parts of the energy survey we distributed were designed to test the energy literacy of households. A series of questions asked straightforward questions regarding electricity bills, knowledge about energy efficiency, and knowledge about appliances. Despite electricity being pre-paid, and requiring more direct involvement than the automated billing found in other countries, our survey suggests that general awareness and knowledge about electricity is low. As Fig. 2 above documented when describing the different classes of consumers, more than 40 percent did not remember their monthly electricity bill size. This is very similar to other studies done in the United States, for example, where consumers were found to usually pay all of their bills at the same time each month and to actually ignore the particular details about kWh consumed. Kempton and Layne (1994) reported that only 40 percent of those surveyed looked at their actual usage of electricity when paying the bill.

Furthermore, only 2 percent of those surveyed in Liaoning Province by our study reported receiving information and brochures on energy saving and energy efficiency, or could describe ways to actually improve efficiency and reduce electricity use. About one-third of respondents said they did not realize appliances still consumed electricity when turned off but plugged in. Roughly half (45 percent) of respondents reported that they have never thought about conserving electricity or energy efficiency before, and 10 percent of respondents (perhaps oddly) stated that they knew how to save electricity but decide not to. When broken down into types of households, only one-fifth of households with children reported an intention to save electricity or promote energy efficiency. Of those from the entire sample that did report an interest in saving electricity, cost was the prevailing factor (accounting for more than 90 percent of responses) rather than environmental protection or other reasons.

### 3.3. Lighting and illumination

The data we collected from our survey show that 12 percent of the electricity in Liaoning homes tended to be consumed for illumination and lighting. Forty-three percent of respondents reported using incandescent bulbs for illuminating, and of them, 28.1 percent said they choose incandescence because they cannot afford energy-saving lamps, 18.4 percent complained that the quality of energy-saving lamps is poor, 28.9 percent said their current incandescent bulb still works and they didn't want to replace it, and the rest said that they don't know of any benefits to more efficient lamps. In addition a few of those sampled stated that it takes a lot of work to change the base to fit a new lamp, and other respondents indicated that the stores selling more efficient lamps and bulbs were too far from their home. In Shenyang, the capital city of Liaoning Province, for instance, the only place to purchase efficient bulbs is the Zhangshi Lamp Market, and it is 15 km from the city center. A round trip taxi ride to this lamp market would cost ¥66, about half the average household's entire electricity bill for 1 month.

Our survey also demonstrated that more than 56 percent of households said they owned at least one energy-saving lamp or light bulb. Interestingly, however, this number contradicts verified data compiled from the NDRC, using sales volumes and load patterns, which suggest that at most only 20 percent of households in the province have one energy-saving light. What explains the discrepancy? Our results imply that many of the people surveyed do not know the difference between energy efficient and energy inefficient lamps, and likely incorrectly attributed themselves owning more fluorescent and compact fluorescent light bulbs when they did in fact not.

### 3.4. Water heating

The data we collected imply that 12 percent of the electricity in Liaoning homes tended to be used for water heating. Our survey suggests that 54 percent of the households own water heaters in Liaoning Province, and 68 percent of these are electric water heaters, 32 percent are solar water heaters. The rate of solar water heater penetration may seem high, but with existing government subsidies and rebates owning a solar water heater is far cheaper than owning an electric water heater (with those respondents that owned solar water heaters indicating their investment paid for itself in less than 2 years). Why, then, do two-thirds of respondents still use electric water heaters?

The survey results show about 38 percent of the respondents who live in urban areas say that local regulators, namely property managers, do not permit the installation of solar water heaters. These officials believe that solar water heaters are subject to significant leakage and seepage of water which can damage and destroy roofs and homes. One-quarter of our own survey respondents said much of the same thing, that a majority of solar water heaters on the market are of poor quality and that companies do not test their products or offer decent warranties. Further complicating the matter, many sellers of solar water heaters remove the labels from them, making it all but impossible to distinguish well manufactured items from dodgy ones. As one measure of how serious the problem of deficient solar water heating technologies is, there are about 100 brands of solar water heaters sold in Liaoning Province but no more than 30 brands are officially registered and certified.

### 3.5. Appliances

Data from our survey suggest that about half (44 percent) of the electricity consumed in Liaoning households went to electric



appliances in 2008, but while this number may seem unusual to people living in places such as the United States it is a four-fold increase from 1998, when only 12 percent of electricity went to appliances in the average Chinese home. Many factors are driving this push towards more appliance use. Lower cost televisions, digital video disc players, washing machines, dish washers, and laptop computers, among other devices, have recently proliferated on the Chinese market. The NDRC subsidizes new purchases of televisions, refrigerators, washing machines, air-conditioners, and computers as a way to increase economic growth. In 2008, for example, buyers of appliances were eligible for a 10 percent discount for new appliances if they were used to offset older models, and the Chinese economic stimulus package had more than ¥2 billion in incentives, rebates, and subsidies for home appliances. Because of these factors, more than 90 percent of respondents indicated that the more convenience appliances can offer, the more units they will purchase (and the more energy households will consume). Induction cookers and microwaves were also becoming much more popular among the rural citizens we surveyed.

### 3.6. Space heating and cooling

The data we collected show that about 32 percent of the electricity in Liaoning homes tended to be consumed for space heating and cooling, although specific loads fluctuate greatly during the summer and winter. During the summer months, many households rely on air conditioning, and one-quarter of households run air-conditioners continually (accounting for up to 30 percent of monthly electricity bills). During the winter months, temperatures in many parts of Liaoning plummet to 30° below zero. District heating systems are in place to provide warmth to some households, but these systems tend to operate only from mid-November to mid-March, they are only available in urban locations, and many households that even have distinct heating find they need supplemental electric heaters to reach comfortable temperatures. During the winter months, electric heating accounts for about 41 of average electricity bills.

### 3.7. Energy efficiency labeling and product identification

In an effort to improve both consumer awareness about energy efficiency and to minimize the use of less efficient appliances, the Chinese government began an energy efficiency labeling and product identification program in March 2005. This national program is managed jointly by the National Development and Reform Commission (NDRC), State Quality Inspection Administration (SQIA), and the Certification and Accreditation Administration (CNCA). Labels initially ranked select air-conditioners, refrigerators, and washing machines on a scale of one to five, with one being the most energy efficient, three being “average, and five being the least efficient (see Fig. 5). In 2008, the labeling program was expanded to include induction cookers, electric heaters, and personal computer monitors. The government also publishes a catalogue listing different appliances and their energy efficiency ratings.

Despite the effort, however, our study highlights some serious concerns with the energy efficiency labeling and product identification program. Only 35 percent of our sample believed that the energy efficiency labels accurately described how the products would perform, and 25 percent indicated they did not care about the label at all when selecting products. The explanation is that Chinese consumers believe that there are systematic errors among both manufacturers (i.e., they lie to the government) and the government (i.e., they mismanage the

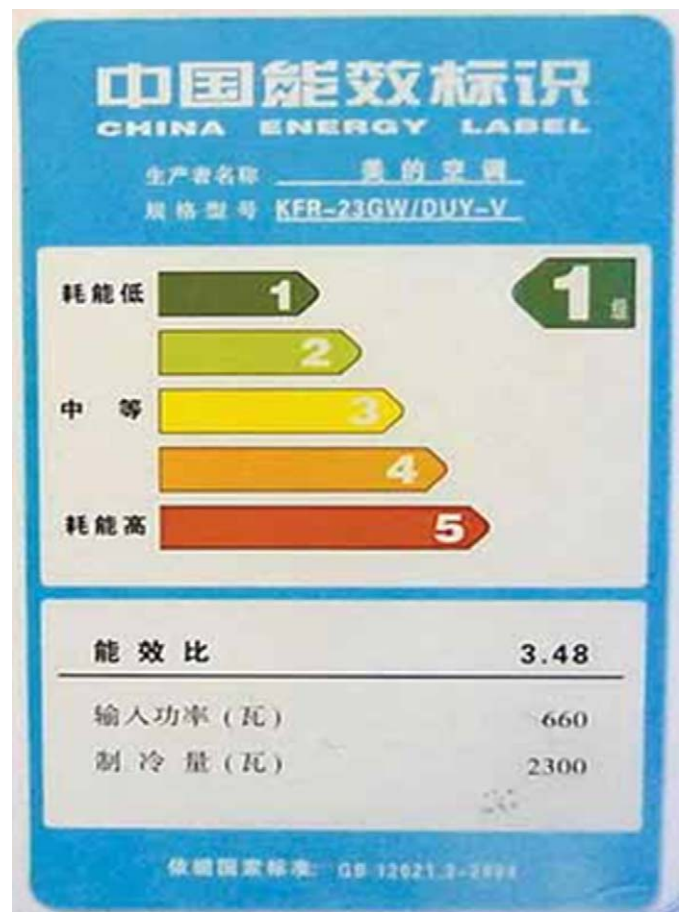


Fig. 5. Chinese energy efficiency label for a Midea Brand air conditioner.

program and are incompetent) in the supervision of the labeling process.

## 4. Conclusion

The results from our study suggest at least two things concerning energy efficiency in Liaoning Province (with possible implications for other communities in China and beyond).

First, a significant portion of the sample of households surveyed for our project reported a willingness to save electricity or purchase more efficient energy using devices, but is constrained by a mesh of interconnected barriers. More than half (55 percent) stated an intention to save electricity and almost half (43 percent) reported using more efficient light bulbs (although these figures contradict official government data).

Yet one-third of respondents indicated they did not remember or care about their electricity bills at all, and efforts to promote energy efficiency are mitigated by the high initial price of energy efficient equipment and a dearth of suppliers in many parts of Liaoning. In some cities, for example, the cost of hiring a taxi to drive to the stores that sell compact fluorescent light bulbs would exceed the electricity savings from those bulbs many times over. Lack of standardization for solar water heaters and a black market for uncertified (and thus cheaper) systems has created a stigma among building inspectors and homeowners against such technologies. Although electricity prices are pre-paid they are still lower than many other industrialized and industrializing countries, perhaps eroding incentives to invest in energy efficiency. The energy efficiency policies in place must also swim upstream

against other incentives for consumer goods, manufacturing, appliance purchasing, and electricity generation. These other Chinese policies, especially NDRC subsidies for new electric appliances, may be working at cross purposes to energy efficiency goals.

Indeed, some preliminary evidence suggests that these problems exist outside of Liaoning. Data compiled by the State Administration for Industry and Commerce in 2007 found that of the energy efficient lamps and light bulbs sold in Beijing, Shanghai, and Guangzhou, less than 40 percent of the 61 products monitored by the government met minimum performance standards. Distrust in energy efficiency labels and product standards are also pervasive. These barriers are simultaneously technical, social, political, and economic, and seem to affirm the conclusions from other studies looking at the comprehensive and interconnected impediments to energy efficiency and renewable energy in Europe and the United States (Sovacool, 2009).

Second, the presence of these barriers to energy efficiency suggests that government policies and programs need augmented and modified. To provide just a few examples, additional subsidies and rebates can help households find the capital needed to invest in energy efficient lights and appliances. Incandescent lamps and other inefficient devices could be taxed, phased out, or banned. Targeted incentives could be designed to force stores to stock and sell more energy efficient products. Rigorous performance standards should be established for solar water heaters and government regulators need to find ways to ensure these standards are enforced. Education programs need to overcome resistance and lack of consumer awareness relating to electricity consumption and energy efficiency labels.

The policies to overcome the barriers to energy efficiency in Liaoning can vary, and the options available to regulators and government officials are multitudinous. Far more important than any single given policy, however, is the necessity of accepting that energy efficiency will not occur by itself, nor will most consumers educate themselves about electricity and electricity use. Furthermore, the solution is not to implement a given policy, such as an energy efficiency label or a program to distribute more efficient lamps, and to then merely presume it will produce results. The barriers and level of consumer awareness in Liaoning remind us that government policies and incentives need constantly monitored, evaluated, and updated. Consumer patterns are always changing, meaning that the policies intended to influence them must change and adjust as well.

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## Appendix A

### Survey questionnaire

1. Do you know your monthly household electricity bill? Yes  No 
  - a) If yes, how much is the electricity bill?
    - Less than 30  30–60  60–100  above 100
  - b) If no, could you give the reason?
    - Don't care  It is not clear on the bill  Other reason
2. How is electricity paid?
  - Pre-paid  Post-paid
3. Do you know the price of electricity?
  - Yes  No
4. Who pays the electricity bill in your household?
  - Husband  Wife  Kids  The elderly  Maid
5. What is the means of illumination in your household??
  - Incandescent lamp  Energy-saving lamp (like Litek)
  - a). If you choose incandescent lamps, why don't you buy energy-saving lamps?
    - High price  The quality is bad  Don't know the benefit  Have no idea
  - b). If the energy-saving lamp was subsidized, would you like to try?
    - Yes  No  It depends
6. What kind of household appliances do you often use?

Television	Rice cooker	Humidifier
refrigerator	Micro-oven	Electric heater
Air-Con	Water dispenser	Fan(cooling)

PC	Vacuum cleaner	Bathroom heater
Washing machine	Induction cooker	Electric Water heater
Sounder	Range hood	Solar water heater

a). If you choose the electrical water heater, why don't you buy a solar one?

High price  The quality is bad  Don't know the benefit  Landlord does not give permission

7. Among the appliances mentioned above, do you have more than one set of the same kind, for example, 2 or 3 televisions, PCs, air-conditioners.

Yes, some of them  Absolutely not

8. Do you know how much electricity these household appliances use?

Yes,  No

9. Which characteristics of household appliances are most important to you?

	Very important	Important	Neutral	Unimportant	Very unimportant
Design and appearance	1	2	3	4	5
Price	1	2	3	4	5
Function	1	2	3	4	5
Energy efficiency	1	2	3	4	5
Brand	1	2	3	4	5

10. Have you ever noted the energy-saving information labeled on the appliances?

Yes  No

11. Do the energy-saving labels on the televisions and refrigerators convince you?

Yes  No  Neutral

12. Are you able to calculate the electricity consumption of all kinds of appliances in your household?

Yes  No, but the other members could calculate  None could calculate in my household

13. Have you ever intended to save or reduce electricity in your household?

Yes  No

(a) If you choose "yes" the reason is:

Cost  Alleviate the pressure of excessive utilization of energy  Environmental protection

14. Who is the most electricity saver in your household?

Husband  Wives  The elderly  Kids  Nobody

15. Do you feel knowledgeable about saving electricity?

Yes  No

16. If you have kids in your household, do they intend to save the electricity?

Yes  No  Neutral

17. Do electric appliances that are plugged in still consume electricity when turned off?

Yes  No

18. Have you ever received brochure on electricity saving?

Yes  No

19. Your personal information:

Gender: Male  Female

Age: Below 20  20–29  30–39  40–49  50 and above

You live in: urban area  rural area

Role in your household:

Husband  Wives  The elderly  Kids  None of them



## Monthly household income:

Below \$1000  \$1000–\$2999  \$3000–\$4999   
 \$5000–\$6999  \$7000–\$8999  \$9000  
 and above

## Years of education:

less than 6 years  7–9 years  
 10–12 years  13 years above

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