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Author

Lin, Jiang

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THE COLLABORATIVE LABELING AND APPLIANCE STANDARDS PROGRAM

Creating and Implementing a Regularized Monitoring and Enforcement System for China's Mandatory Standards and Energy Information Label for Appliances

Author:
Jiang Lin

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Executive Summary

CLASP has assisted China in developing 11 minimum energy performance standards (MEPS) for 9 products and endorsement labels for 11 products including: refrigerators; air conditioners; televisions; printers; computers; monitors; fax machines; copiers; DVD/VCD players; external power supplies; and set-top boxes. CLASP has also assisted China in the development of the mandatory energy information label.

Historically, China's S&L program has been heavily focused on the technical requirements for efficiency performance, but lacking in administrative and personnel capacity to undertake monitoring and enforcement. As a consequence, compliance to both the mandatory standards and the mandatory energy information label is uneven with the potential and likely result of lost energy savings. Thus, a major area for improvement, which could significantly increase overall energy savings, is the creation and implementation of a regularized monitoring system for tracking the compliance to, and enforcement of, mandatory standards and the energy information label in China.

With support from METI, CLASP has been able to expand upon an on-going collaboration with CNIS on enforcement and monitoring of S&L programs in China. This report summarizes the findings of these activities and identifies the progress that China is making, and can make, toward developing a stronger system of monitoring and enforcement (M&E).

By way of background, the report summarizes the history and nature of China's standards and labeling program in the Introduction in Section 1. Key players in China's S&L program and their roles along with a summary of the legislative and regulatory structure behind China's S&L program are provided in Section 2. **This section of the report concludes that the existing legal basis for monitoring and enforcement in China is sufficient.** It includes multiple laws and regulations that define the roles of various government agencies and articulates a system of fines and penalties for non-compliance.

Overall, however, the report concludes in Section 3 that in comparison with best international best practices, China's monitoring and enforcement effort of mandatory energy efficiency standards and labels has been modest at best. In particular, while AQSIQ is nominally in charge of monitoring and enforcement efforts for S&L, lack of staff and funding has prevented it from performing either function well. Compliance monitoring of MEPS has not received proper attention, due to competing priorities. While compliance monitoring for the mandatory label is the purview of CELC, no government funding has been provided to carry out such effort¹.

National product quality supervision testing is at present the main mechanism to verify products' compliance status to standards and AQSIQ is in charge of organizing this. There are two types of national product quality supervision testing: regular and special. The regular product quality testing happens every quarter and the special product quality testing is set according to the degree of concern over product quality. There are thousands of types of

¹ CELC does not have enforcement authority for the mandatory label either, and has to refer any violations to AQSIQ for any enforcement actions.

consumer products on the market, and the emphasis is on product safety. Thus, energy efficiency receives little priority in the national product quality testing. For example, in the 2nd quarter of 2005, AQSIQ organized national testing for clothes washers. A total of 30 models from 30 manufacturers were tested. A total of 29 met the standard requirements on safety and performance. However, energy efficiency was not tested during this test and so no data is available on how many of these met national energy efficiency requirements. In the first half of 2006, AQSIQ also organized a special product quality test on room air-conditioners, which covered products from 29 manufacturers. While the manufacturers covered in this special test represent roughly 43% of air-conditioners manufacturers in China, the models tested represent only less than 1% of all models of room air-conditioners in the market. Thus, the report finds that limited sample size is a significant weakness in the existing testing. Lastly, the sampling process for MEPS testing potentially weakens the robustness of the national production quality test as samples are taken by one or more national laboratories, at manufacturers' warehouse on site. According to CELC, it is possible that some manufacturers could set up a dedicated warehouse for all testing programs, therefore undercutting the effectiveness of sampling. Manufacturers interviewed have discounted such a possibility. However, the report suggests that a market-based sampling approach targeted at the retail or wholesale channels would be more robust.

The report also notes that the basic infrastructure for appliance performance testing is in place in China, however, the technical capacities need to be improved to meet the challenge of a much expanded national verification testing program. There are three national testing laboratories that are accredited by the China National Commission of Accreditation (CNCA), and about 50 more local testing laboratories². The three key national testing laboratories have shouldered most of the current testing for the national product quality test and have strong technical capabilities and adequate equipment. However, if the scale of the national testing program was expanded (as proposed by many stakeholders interviewed as a part of this research), then their capacities may need to be expanded and, given the geographic spread of the Chinese market, there is also a need to develop testing centers in other regions as well. Further, improving the consistency of test results between test laboratories is a critical and necessary step in setting up a comprehensive national testing program.

The report concludes that the key gaps between China's current M&E system and international best practices are in the following areas: 1) there is no product registration and reporting requirement for MEPS; 2) though such a requirement is in place for the China Energy Information Label this covers only two products; 3) monitoring and verification of products performance are inadequate in China, both for the MEPS and the Energy Information Label and in particular limited by sample sizes too small to qualify for vigorous monitoring as well as a lack of attention to energy efficiency versus other issues such as health and safety; 4) there is insufficient funding to undertake verification testing for MEPS and the Energy Information Label; and 5) the testing infrastructure in China is relatively weak in comparison with the need.

² According to answer provided by CNIS to a questionnaire on test laboratories.

Per Section 4 of this report, the findings above were supported in conversations with stakeholders as reported in an M&E road-mapping workshop organized by CLASP as well as in interviews. One new finding that emerged from the workshop was that the existing national testing program may present a credible if modest threat to major producers. Given their visibility and the multitude of product models they offer, the large manufacturers are invariably selected in national product quality tests. The damage of potentially bad publicity is a huge liability to them, according to manufacturer representatives present at the workshop. These large manufacturers complained that small rivals are less accountable.

During the roadmap workshop, there was a consensus that verification testing for appliances should be significantly expanded and strengthened to cover more product types and a greater share of the models, in order to enhance the effectiveness of the appliance standards and labels in China. For example, it was proposed that the sample size for the national verification testing should be raised from about 1% of models now to 25-30% of the models available. To improve the objectivity of the national product quality testing, CNIS suggested that enforcement agencies need to set up their own independent test laboratories to complement the existing network of test laboratories. These publicly-funded laboratories could provide invaluable information to support the development of appropriate standards as well as serve as a quality control tool for test results from commercial laboratories.

Another finding of the roadmap workshop and related interviews was that other stakeholders such as industry associations, consumer groups and retailers can play a role in strengthening S&L M&E in China.

Section 5 of the report focuses on next steps and suggests that it is critical that AQSIQ allocate more staff and budget in order to strengthen the monitoring and enforcement effort. Alternatively, AQSIQ could entrust the daily operations of monitoring and verification for the MEPS program to a dedicated and independent institution, such as CELC, while AQSIQ retains the enforcement authority.

Discussion with a variety of stakeholders in China indicates that the ideal form of a future monitoring and enforcement system in China would include:

- **A dedicated and integrated monitoring and enforcement agency with clear responsibility and adequate funding;**
- **A mandatory reporting and certification system for all products covered under the mandatory standards and labeling programs;**
- **An expanded and transparent verification testing program that includes all products covered under the mandatory standards and labeling programs;**
- **A strong network of testing laboratories accredited by the CNCA;**
- **Credible penalties for non-compliance; and**
- **A clear procedure for dispute resolution.**

The report suggests an implementation plan to address shortcomings in the existing M&E system including the following steps:

1. Boosting the capacity of China Energy Label Center as an administrator of monitoring and testing program, both for MEPS and China Energy Information Label;
2. Launching an expanded verification testing for products under the mandatory label;
3. Creating a national registry and reporting requirement for MEPS products;
4. Creating a certification requirement for all regulated products;
5. Developing a plan for expanded national verification testing;
6. Identifying potential partners for regional test laboratories and developing appropriate capacity building plans with and for them; and
7. Developing plans to improve the consistency of test results such as round robin testing and training.

The report further concludes that international assistance and/or funds from CDM could be an aide to enhancing China's E&M system due to the difficulty in securing the necessary funds. For expanded national verification alone, the cost is estimated by CLASP and its partners to be between 7,000,000 and 17,500,000 RMB (109.2 to 273 million yen). This figure is in the range of ten times the current appliance testing budget.

In sum, the report finds a consensus among various stakeholders interviewed during the course of this research (including representatives from manufacturers, program administrators, researchers, and testing laboratories) that expanded and persistent verification testing over time is needed in China and is the most effective approach to increase compliance to mandatory standards and labels and consequently the energy savings of these programs.

1 Introduction:

China has developed a comprehensive program of energy efficiency standards and labels for household appliances. In 1989, China first launched its minimum energy performance standards (MEPS), which are now applied to an extensive list of products. In 1998, China launched a voluntary energy endorsement label, which has grown to cover both energy-saving and water-saving products. And, in 2005, China launched a mandatory energy information label that initially covered two products.

CLASP has assisted China in developing 11 minimum energy performance standards (MEPS) for 9 products and endorsement labels for 11 products including: refrigerators; air conditioners; televisions; printers; computers; monitors; fax machines; copiers; DVD/VCD players; external power supplies; and set-top boxes. CLASP has also assisted China in the development of the mandatory energy information label.

Increasingly, attention is being placed on maximum energy savings from China's standards and labeling (S&L) efforts in order to meet the recently announced goal of reducing China's energy intensity by 20 percent by 2010 with an interim objective of 4 percent in 2006.

China's mandatory standards system is heavily focused on the technical requirements for efficiency performance, but historically, it has lacked administrative and personnel capacity to undertake monitoring and enforcement of these legally binding standards. Similarly, resources for monitoring and enforcement have been quite limited. As a consequence, compliance to both the mandatory standards and the mandatory energy information label is uneven with the potential and likely result of lost energy savings. Thus, a major area for improvement, which could significantly increase overall energy savings, is the creation and implementation of a regularized monitoring system for tracking the compliance to, and enforcement of, mandatory standards and the energy information label in China.

CLASP has been working with the China National Institute of Standardization (CNIS), the China Administration for Quality, Supervision, Inspection and Quarantine (AQSIQ) and relevant stakeholders in the industry to develop a stronger system of monitoring and enforcement. In November 2005, CNIS and LBNL (a CLASP implementing partner) with funding from the Energy Foundation jointly organized an international workshop to present the international best practices in S&L monitoring and enforcement. Currently, CNIS is developing a guideline for monitoring and enforcement for appliance standards.

With support from METI, CLASP has been able to expand the on-going collaboration with CNIS to include enforcement needs for the mandatory energy information label and to accelerate the progress of the project to develop a more robust monitoring and enforcement for S&L programs in China. This expanded effort has included:

1. Holding an enforcement and monitoring roadmap planning workshop with key S&L stakeholders;
2. Interviews with S&L stakeholders on the need and scope of national compliance tests;
3. Research on past enforcement activities;
4. An analysis of compliance data from the mandatory energy information labeling program;
5. Interviews with stakeholders on the need and scope of testing infrastructure; and
6. Development of a roadmap for future activities.

This report summarizes the findings of these activities and identifies the progress that China is making, and can make, toward developing a stronger system of monitoring and enforcement (M&E). In sum, it outlines a vision of moving forward with more vigorous M&E in China.

2 Existing Regulatory Infrastructure for Standard and Label Development

2.1 Basic Structure of China's Appliance Standards and Labeling Program

China started its appliance energy efficiency standards program for household appliances in 1989, when the former State Bureau of Technical Supervision (SBTS) published a set of standards for eight consumer products including: refrigerators; air-conditioners; clothes washers; and televisions (See Table 1). It was not until the passage of China's Energy Conservation Law (ECL) in 1997 that SBTS, supported by the China National Institute of Standardization (CNIS), accelerated development and revision of standards for a wide variety of consumer appliances and lighting products. Currently, China has mandatory standards for 22 categories of appliances (as is also listed in Table 1).

Table 1: Mandatory Energy Efficiency Standards in China

Standard Number	Standard Name	Remark
GB12021.1-1989	The limited value and testing method of energy consumption (efficiency) for household and other similar electric appliances	
GB12021.2-2003	The maximum allowable values of the energy consumption and energy efficiency grades for household refrigerators	Second revision
GB12021.3-2004	The minimum allowable values of the energy efficiency and energy efficiency grades for room air conditioners	Second revision
GB12021.4-2004	The minimum allowable values of the energy efficiency and energy efficiency grades for household electric washing machines	First revision

GB12021.5-1989	The limited value of energy consumption and method of testing for electrical irons	Abolished
GB12021.6-1989	The limited value and testing method of efficiency and warming energy consumption for automatic rice cookers	
GB12021.7-2005	The limited value and testing method of energy efficiency for broadcasting receiver of color television	First revision
GB12021.8-1989	The limited values of efficiency and methods of measurement on radio receivers	Abolished
GB12021.9-1989	The limited value of energy consumption of electric fans and its measuring method	
GB 17896- 1999	Limited values of energy efficiency and evaluating values of energy conservation of ballasts for tubular fluorescent lamps	
GB 18613-2002	Limited values of energy efficiency and evaluating values of energy conservation of small and medium three-phase asynchronous motors	Revision in progress
GB 19043-2003	Limited values of energy efficiency and grading criteria of double-capped fluorescent lamps for general lighting service	
GB 19044-2003	Limited values of energy efficiency and grading criteria of self-ballasted fluorescent lamps for general lighting service	
GB 19153-2003	Limited values of energy efficiency and evaluating values of energy conservation for displacement air compressors	
GB 19415-2003	Limited values of energy efficiency and evaluating values of energy conservation for single-capped fluorescent lamps	
GB 19576-2004	Limited values of energy efficiency and grading criteria of unitary air conditioners	
GB 19577-2004	Limited values of energy efficiency and energy efficiency grades for water chilling packages	
GB 19573-2004	Limited values of energy efficiency and grading criteria for high-pressure sodium vapor lamps	
GB 19574-2004	Limited values of energy efficiency and evaluating values of energy conservation of ballasts for high pressure sodium lamps	
GB19578-2004	Limits of fuel consumption for passenger cars	
GB19762-2005	Limited values of energy efficiency and evaluating values of energy conservation of centrifugal pumps	

	for fresh water	
GB19761-2005	Limited values of energy efficiency and evaluating values of energy conservation for fans	
GB20052-2006	Limited values of energy efficiency and evaluating values of energy conservation for distribution transformers	
GB20053-2006	Limited values of energy efficiency and evaluating values of energy conservation of ballasts for metal halide lamps	
GB20054-2006	Limited values of energy efficiency and grading criteria for metal halide lamps	

SBTS has since been succeeded by the China General Administration of Quality Supervision, Inspection, and Quarantine (AQSIQ). AQSIQ is under the direct supervision of the State Council—China’s Cabinet— and has the responsibility of:

- Developing relevant laws and regulations related to national standards;
- Long-term planning;
- The development and revision of standards;
- Standards education and training; and
- Enforcement.

On energy efficiency standards, however, the National Development and Reform Commission (NDRC) also has considerable influence given its central role in economic and energy planning, and as the coordinator for the implementation of ECL.

Figure 1: China's Voluntary Energy Efficiency Label



In addition, China’s Energy Conservation Law (Article 18) stipulates that a product certification system be developed to promote energy-conservation products:

Enterprises may, in accordance with the principle of voluntarism and in pursuance of the state provisions relating to product quality authentication, apply to the authentication agencies acknowledged by the department of product quality

supervision and administration under the State Council or the departments authorized by the department of product quality supervision and administration under the State Council for energy-consuming product energy-saving quality certification; the enterprises which pass the

certification shall obtain a certificate and use the energy-saving quality certification mark on the energy-consuming products or their packages.

And, in accordance with the ECL, China introduced a voluntary energy certification label that is similar to the Energy Star label in the US in 1998 (See Figure 1). The China Standard Certification Center (CSC)³, an affiliate of CNIS, is the administrator of this voluntary endorsement labeling program. The CSC program currently covers over 50 categories of consumer appliances, lighting, electronics, and industrial equipment and includes products with water-saving features as well.

China's ECL also stipulates (Article 26) that:

Units and individuals making energy-consuming products shall truthfully annotate the energy consumption index on product descriptions and product marks.

After much deliberation, China introduced a mandatory categorical energy information label for appliances in 2004 which is similar to the EU labeling program (See Figure 2). This mandatory label separates relevant products into five efficiency levels, with level 1 as the most efficient and level 5 the least efficient. Level 5 also corresponds to the minimum requirement of the minimum energy efficiency standards.

CNIS is the administrator of this program through the newly established China Energy Label Center (CELC). At the moment, only household refrigerators and air-conditioners are subject to this mandatory labeling program which has been implemented since March 2005. It is expected that clothes washers and unitary air-conditioners will be added to the program in 2007.

Figure 2: China's Mandatory Information Label



2.2 Enforcement Authority and Legal Statutes

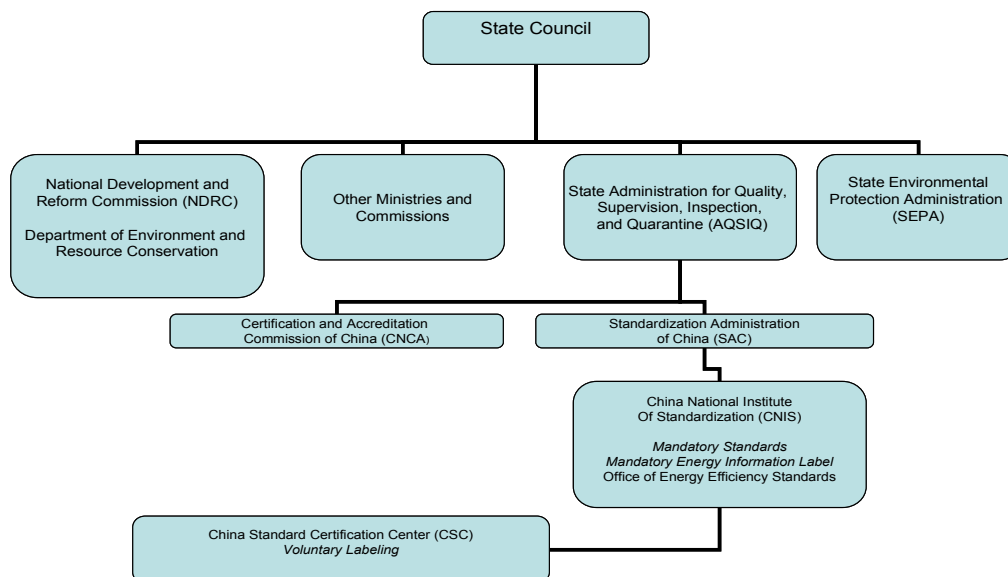
Implementation of China's appliance standards and labels is governed by a variety of laws and regulations and carried out by several related agencies and departments. These laws and regulations include: the *Standardization Law of China* and its *Implementation Regulations*; the *Management Method of Energy Conservation Products Certification*; the *Management Method of National Supervision and Spot Checking of Products Quality*; and the *Management Method of Energy Efficiency Label*. Agencies involved in implementation and enforcement of appliance standards and labels include: AQSIQ and its provincial branches; CNIS; and CSC. Figure 3 provides an organization

³ Formerly called the China Certification Center for Energy Conservation Products (CECP).
www.cecp.org.cn

chart of the players in standards and labeling development in China with the specific aspect of the S&L program that they manage noted in *italics*.

AQSIQ at the national level sets the agenda for standard compliance monitoring and inspection; organizes the national product quality supervision testing and publishes the testing results. Enforcement responsibilities are delegated to local AQSIQ branches at the provincial, city, and country level. CELC (within CNIS) sets the monitoring agenda for the mandatory label; organizes the random check testing; and publishes the testing results. However, CELC does not have enforcement power but instead refers the non-compliance cases to AQSIQ for enforcement action. CSC implements the voluntary endorsement label for energy conservation products. CSC relies on on-site inspection and certification to ensure compliance to its labeling requirements.

Figure 3: Organizations Involved in Development of Energy Standards & Labels.



2.2.1 China's Standardization Law and its Implementation Regulations.

China's Standardization Law and its Implementation Regulations were issued by the State Council in 1998. Article 36 of the Implementation Regulation (of the Standardization Law) stipulates specific enforcement actions for entities that are engaged in production, sales and imports of products not meeting mandatory standards:

Enterprises that produce products which fail to meet compulsory standards shall be ordered to stop production and their products shall be confiscated, destroyed under supervision or subjected to necessary technical treatment; a fine ranging from 20% to 50% of the total value of the goods shall be imposed on the enterprises; and a fine of 5,000 Yuan⁴

⁴ RMB 1 yuan equals to 15.6 yen.

or less shall be assessed on the persons held responsible. Those who sell goods which are not up to the compulsory standards should be ordered to stop their sales and recover the goods which have already been sold within a set time-limit. All the goods should be destroyed under supervision or subjected to necessary technical treatment. The illegal gains shall be confiscated and a fine ranging from 10% to 20% of the total value of the goods shall be imposed on the units and a fine of 5,000 Yuan or less on the persons held responsible. If any units import goods which are not up to compulsory standards, the goods should be sealed up for safekeeping and confiscated, destroyed under supervision or subjected to necessary technical treatment. A fine ranging from 20% to 50% of the total value of the imported goods shall be imposed on the units; administrative sanctions shall be given to and a fine of 5,000 Yuan or less may also be imposed on the persons held responsible. Production halt and administrative sanction specified under this Article shall be determined by relevant administrative authority; other administrative penalties should be determined by the standards authority and the industry and commerce management agency.

It is clear that the Standardization Law and its Implementation Regulations provide specific guidelines on appropriate penalties for the violation of mandatory standards including MEPS.

2.2.2 Regulations on Energy Standards

AQSIQ also issued the Management Method for Energy Standardization to define the enforcement authority for energy standards. Article 8 of the Management Method for Energy Standardization stipulates:

Compulsory energy standards must be conducted and implemented. Energy products, energy saving materials and energy consuming equipment, of which the design, production, sale and import fall short of the compulsory standards, shall be treated according to the Implementation Regulations of the Standardization Law of the People's Republic of China.

For supervision and enforcement of energy standards, Article 10 stipulates:

The administrative departments in charge of standardization in the people's governments above county level (including county level), shall be responsible for supervision and inspection of implementation of energy standards. Energy supervision and inspection agencies or authorized and competent inspection agencies, which are established according to actual needs by the administrative departments in charge of standardization in the people's governments above county level, shall undertake tasks of supervision and inspection concerning the implementation of energy standards.

Thus, AQSIQ offices at the county, city, and provincial level, and their designated inspection institutions, have clear authority to enforce the mandatory energy efficiency standards. However, these local agencies rarely monitor the compliance status of household appliances, outside of the national product quality supervision test organized by AQSIQ. Thus, their enforcement authority is not applied very often.

2.2.3 Current Enforcement and Monitoring Mechanism

For products covered under the MEPS program, there is no regular monitoring of product performance once the product has been introduced. There is neither a national registry of product performance, nor a reporting requirement, making it difficult to monitor the compliance status of household appliances.

National product quality supervision testing is at present the main mechanism to verify products' compliance status to standards. According to the *Management Methods of National Supervision and Random Inspection of Products Quality*, which was revised in 2005, AQSIQ, as designated supervision agency for product quality, is in charge of organizing national product quality testing and publicizing the testing results and enforcement actions against offenders.

There are two types of national product quality supervision testing: regular and special. The regular product quality testing happens every quarter and the special product quality testing is set according to the degree of concern over product quality. As part of the product quality testing, AQSIQ establishes the *List of Major Products Subjected to National Supervision and Random Inspection* to help set the priority of product testing. It is stipulated in the *Management Methods of National Supervision and Random Inspection of Products Quality* that priority should be given to products concerning human health, personal and property safety, industry products essential to the national economy and the people's livelihood, and products that have been reported to have quality defects by consumers.

Given that there are thousands of types of consumer products on the market, and the emphasis on product safety, energy efficiency receives little priority in the national product quality testing. The most frequently tested appliance products are clothes washers, refrigerators, and air-conditioners. All have been tested two to three times in the last few years. Typically, only one model per manufacturer is tested, and each national quality test covers between 20 to 30 manufacturers. For example, in the 2nd quarter of 2005, AQSIQ organized national testing for clothes washers. A total of 30 models from 30 manufacturers were tested. A total of 29 met the standard requirements on safety and performance. However, energy efficiency was not tested during this test and so no data is available on how many of these met national energy efficiency requirements. The cost of the national product quality test is born by AQSIQ, ranging from RMB 100,000 to 200,000 (1.56 to 3.12 million yen)⁵.

⁵ Exchange rate used: RMB 1 yuan = 15.6 yen

In the first half of 2006, AQSIQ also organized a special product quality test on room air-conditioners, which covered products from 29 manufacturers. While the manufacturers covered in this special test represent roughly 43% of air-conditioners manufacturers in China, the models tested represent only less than 1% of all models of room air-conditioners in the market. It is widely agreed during interviews with Chinese experts and manufacturers that the national product quality test is inadequate, because of small sample sizes, lack of efficiency measures, the frequency of the test for household appliances. However, these inadequacies are largely due to a lack of government funding for the product quality test.

It was discovered during the course of this research that AQSIQ only has half a million RMB (7.8 million yen) per year allocated for testing for all household appliances, home electronics, and lighting products. CNIS also conducted archival research on the products that were tested in the past and was able to find data going back to 2001. The results are presented in the table below. Major household appliances (white goods) are highlighted in red. Refrigerators were tested twice (2003 and 2004), freezers were tested once (2005), room air-conditioners were tested twice (2003 and 2004), clothes washers were tested three times (2002, 2005, and 2006).

Table 2: History of national product quality inspection testing for appliances

Test Date	Product Types	No. of companies	No. of products	No of qualified products	No. of disqualified products
2001					
4 th Quarter	CFL	76	77	20	57
4 th Quarter	Fluorescent fixtures	51	51	22	29
2002					
1 st Quarter	Incandescent lamps	45	45	37	8
1 st Quarter	Exhaust fans	20	20	17	3
2nd Quarter	Circular fluorescent lamps	19	23	21	2
2nd Quarter	Color TV	14	14	12	2
2nd Quarter	Electric oven	58	63	47	16
2 nd Quarter	Clothes washers	16	16	15	1
3 rd Quarter	Rice cookers	23	23	19	4
4 th Quarter	Electro-magnetic stoves	22	22	21	1
4 th Quarter	Vacuum cleaners	12	12	8	4
4 th Quarter	Indoor heaters	18	18	12	6
4 th Quarter	Self-ballasted fluorescent lamps	58	62	37	25
2003					
2003	Fluorescent lamps	19	22	17	5
2003	Refrigerators	28	28	27	1
2003	Electric fire-pot	25	25	20	5
2003	Electric thermos	24	24	17	7
2003	Self-ballasted fluorescent lamps	54	54	36	18
2003	Electric oven	34	37	23	14

2003	Twin-cap fluorescent lamps	29	29	16	13
2003	Room air-conditioners	24	24	23	1
2003	Exhaust fans	17	17	15	2
2nd Quarter	Unitary air-conditioners	16	16	16	0
2004					
2004	Room air-conditioners	21	21	17	4
2004	Refrigerators	28	28	27	1
2004	Rice cookers	16	16	13	3
2004	Electric thermos	24	24	17	7
2005					
2005	Household clothes washers			29	
2005	Electro-magnetic stoves	21	21	19	2
2005	Circular fluorescent lamps	28	28	23	5
2005	Electro-magnetic stoves	36	36	31	5
2005	Home audio amplifiers	26	26	19	7
2005	Twin-cap fluorescent lamps	41	41	24	17
2005	Electric thermos	25	25	18	7
2005	Freezers			11	
2006					
2006	Household clothes washers	26	26	25	1
2006	Electro-magnetic stoves	23	23	19	4
2006	Multi-unit air-conditioners	14	14	13	1
2006	Electric thermos	23	23	19	4
2006	Electric fans	34	34	31	3
2006	CRT color TV	24	25	20	5

While AQSIQ sets the work plan for the national product quality test, the actual implementation of the test is typically contracted to a qualified testing institution. For household appliances, three key national test laboratories are most frequently used. They are: the State Quality Supervision Testing Center of Household Electric Appliance in Beijing; the State Domestic Appliance Quality Supervision Center in Guangzhou; and the State Quality Supervision Testing Center of Compressor and Mechanical Cooling Appliances in Heifei. These are test centers affiliated with key national research institutes in the appliance industries and have been accredited by CNCA as national testing laboratories. They have highly qualified professionals and their test results are well respected in the appliance industry. According to surveys by CELC, the Beijing testing center has about 50 staff members, the Guangzhou center 100 staff members, and the Heifei center 60 staff members. Most are trained in safety testing, and only a minority is trained on performance testing. Funding from these test laboratories are mostly from appliance manufacturers for performing various tests for compliance purposes. State funding for all three laboratories are in the form of testing fees for the national product quality supervision test, in the range of 200,000 to 300,000 RMB (3.12 to 4.68 million yen).

The China Energy Label Center (CELC) was recently established within CNIS to supervise the registration and to monitor the use of energy information labels. Currently, CELC has 6 full time staff members, but no regular budget for monitoring the compliance of the energy information label⁶. There are only two products that are currently covered under the mandatory energy information label: refrigerators and room air-conditioners. Manufacturers are required to submit

⁶ Interview with Wang Ruohong, the deputy director of the China Energy Label Center, November 14, 2007.

product performance information to CNIS but allowed to print the label on their own products and product literatures. There is no fee to the manufacturers for the use of the label. The mandatory labeling program was launched on March 1, 2005. By October, 2005, 78 manufacturers had submitted energy performance data for a total of 2100 models of refrigerators. A total of 68 manufacturers had submitted energy performance data for a total of 4123 models of room air-conditioners, according to CELC based on its label product database.

Concerned about the integrity of the mandatory energy information label, CELC recently raised a modest amount of funding (RMB 400,000 or about 6.24 million yen) from NDRC and CNIS to conduct sample tests for refrigerators and room air-conditioners. In contrast to the national product quality testing where samples are taken from manufacturers' warehouses, samples were purchased from retail markets in Beijing, Heifei, and Guangzhou, and tested in the three national test laboratories in those three cities. The results are being compiled at the moment and it could take some time for CELC to publish the results of the testing, since manufacturers are allowed to challenge the test results.

3 Assessment of China's Baseline E&M Structures and Systems

3.1 Summary Description of International Best Practice E&M systems/structures

Over 40 countries around the world have adopted minimum energy efficiency standards (MEPS) and energy efficiency labels for domestic appliances and lighting product (CLASP)⁷. While some countries have developed detailed monitoring and enforcement regulations such as the US, Canada, and Japan, others only have limited enforcement mechanisms for ensuring compliance to standards and labeling requirement. A well-developed enforcement framework is essential to the effectiveness of efficiency standards and labeling programs. Without effective enforcement, it is difficult to deter false claims by the vendors of less-efficient products. While various efficiency standards and labeling programs have developed their own approaches in enforcement, there are several common elements to all successful programs (CLASP 2005):

- 1) Establish testing capability and an accreditation process;
- 2) Establish consistent criteria for certifying the energy efficiency of the products;
- 3) Tailor the compliance approach to existing public and private resources;
- 4) Monitor and report compliance and non-compliance;
- 5) Establish a graduated response to non-compliance;
- 6) Establish sufficient penalties and adequate administrative processes; and
- 7) Develop a dispute resolution mechanism.

Establishing adequate testing capability is a critical first step in developing a comprehensive enforcement framework. Without accurate measurement of the energy performance, it would be impossible to set and enforce any meaningful efficiency standard. Accurate measurement depends on practical and consistent testing protocol as well as competent testing laboratories.

⁷ CLASPOnline.org

A good testing protocol should reflect common usage pattern of the products, and needs to be robust enough to produce consistent testing results. Therefore, developing a good testing protocol requires a great deal of technical expertise, which may be difficult to obtain in emerging economies. Fortunately, there are well established international testing protocols for most household appliances that can be referenced. In fact, adopting established international testing protocol is a good practice, since it facilitates the harmonization of standards between economies and promotes trade in domestic appliances as most economies require appliances to be certified in some fashion before being sold in their jurisdictions.⁸ To ensure laboratory competency, it is important to develop an accreditation system for testing laboratories. Typically, there is a national body that is authorized to accredit testing laboratories according to their expertise.

The second step is to develop a reporting and certification mechanism for testing results. This can be done by a government agency. It can be self-certification by manufacturers. Or it can be done by industry associations such as Association of Home Appliance Manufacturers (AHAM). Typically, the efficiency of all model numbers must be reported to a designed government agency. The submission of data could be done by manufacturers, industry associations, and testing laboratories.

The third step is to establish a verification mechanism of reported energy performance of appliance products. There are typically two types of verification processes. When a product is first introduced to the market, the manufacturer/supplier typically has to register with designated government bodies with proof that their products meet relevant product standards including energy performance. After a product is already on the market, check testing needs to be conducted to ensure that the claimed performance is true. Different countries have somewhat different approaches in running check testing, typically determined by local regulatory structure and available government or industry resources. In some countries, every model is tested, in others a sample of products are tested. Such check testing can be done by government or third-party laboratories.

Monitoring of compliance is also integral part of an enforcement framework. It is important to designate one government agency that is charged with enforcement authority. It is equally important that sufficient penalties, including monetary fines, are set to deter false claims of compliance. However, once non-compliance is reported, the accused must be afforded a chance to dispute the charge of non-compliance through re-testing of its products. Such a dispute resolution process should be clearly defined. Once non-compliance is ascertained, there are several options for compliance actions. It should be noted that often a graduated response is better at achieving long-term compliance. Options include: private warning/dialogue; public notification; ordering change; fines; and elimination of the offending products from the market place.

In the United States, there are three S&L programs for household appliances: a mandatory energy efficiency standard program; a mandatory energy information labeling program; and a voluntary energy labeling program. The Department of Energy (DOE)

⁸ In some cases provisions in international standards may conflict with common usage in a particular country. An example of this is the temperature used for washing clothes in different countries.

manages the development and enforcement of minimum energy efficiency standards (MEPS); the Federal Trade Commission (FTC) manages the development and enforcement of the mandatory energy information label, the Energy Guide; and the Environmental Protection Agency (EPA), together with DOE, manages the development and enforcement of the voluntary labeling program, Energy Star. DOE and FTC mainly rely on self-enforcement. Manufacturers typically test their own products and report data on energy efficiency to FTC and DOE. Manufacturers must report to DOE when a new model is introduced or when a model is discontinued. Competing companies often test each others products and report to FTC or DOE if a competitor is not in compliance. In fact, anyone can report product non-compliance to DOE and DOE will evaluate the report to see if it has merit. Typically, this would require some evidence obtained by testing.

For some products, a trade association manages a voluntary certification program. Manufacturers submit their test results to the trade association which publishes the results in a directory. The trade association has a contract with an independent test laboratory to run check (verification) tests. These verification tests make sure that manufacturers are all submitting valid data. They also ensure that participating manufacturers all run the tests in a uniform way. This verification program administered by the trade associations reduces the burden on manufacturers to test their competitors' products to ensure accurate reporting of test results. Manufacturers typically also run their own tests and continually compare them to the results obtained by the trade association.

Manufacturers may also authorize, i.e., sign an agreement with the trade association, to have them report efficiency data to FTC and DOE, to simplify paperwork requirements. Alternately, manufacturers may participate in the trade association program but report compliance information to FTC and DOE themselves. Manufacturers could also hire an independent test laboratory and report the test results to DOE and FTC. No matter who does the testing, the manufacturer is ultimately responsible for the test results. Trade associations with such verification programs include: the American Refrigeration Institute (ARI); the Association of Home Appliance Manufacturers (AHAM); and the Gas Appliance Manufacturers Association (GAMA).

In Canada, Natural Resources Canada (NRCan) requires that all regulated products must bear an energy performance verification mark before the products leave the possession of the dealer. This verification mark indicates that energy performance of the regulated product has been verified. This mark must be the mark of either a recognized verification agency or a province. These certification agencies must be accredited by the Standards Council of Canada (SCC) and recognized by the Minister of NRCan as the administrator of an acceptable energy performance verification program for the prescribed product. Under some provincial laws, a province can issue a provincial label that indicates that the product meets the provincial energy efficiency levels. NRCan accepts provincial labels as verification marks if the provincial energy efficiency standards are equivalent to, or exceed, the federal standards. Unlike the U.S. standards, provincial governments can have more stringent energy regulations than the federal government. The certifications organizations are currently accredited by the SCC include: ARI; CSA International

(CSA); Intertek Testing Services NA Inc.; Intertek Testing Services NA Ltd.; and Underwriters Laboratories Inc. (ULI).

Australia has both a mandatory standards and mandatory labeling program, in addition to voluntary standards and labeling programs. The implementation of these programs is the purview of the States, but the national government works with the States to ensure that standards and labels are implemented in a uniform fashion across Australia⁹. All regulated products under MEPS or the mandatory Energy Label have to be registered with the States. State inspectors conduct audits at retail outlets. Penalties include: fines; cancellation of product registration; and possible prosecution. Third party laboratories are also contracted by the government to perform national check testing. Unqualified products could lose their registration.

3.2 Comparison of Baseline Chinese System to International Best Practice

Based on the review of existing laws and regulations related to energy efficiency standards and labels presented in section 2.2, China already has a solid legal foundation to support the development and enforcement of energy efficiency standards and labels. Further, China's *Energy Conservation Law* and the *Energy Conservation Mid- and Long-Term Plan* specifies that relevant departments of the government develop energy efficiency standards and labels for major energy-consuming residential and commercial products. AQSIQ, as an agency directly under the State Council, has the clear mandate on standards development and enforcement. The *Standardization Law* and its *Implementation Regulation* also provide concrete guidelines to enforce mandatory standards, and define specific penalties for violation.

In comparison with best international best practices, however, China's monitoring and enforcement effort for its mandatory energy efficiency standards and labels has been modest at best. The lack of monitoring and enforcement effort is to a large extent due to lack of state funding for this effort and the fact that there is no dedicated government agency or sufficient staff devoted to enforcing mandatory energy efficiency standards and labels for household appliances. This task is lumped together with enforcement of quality standards for thousands of consumer and commercial products, ranging from salted duck eggs to baby formula. As a consequence, energy efficiency standards receive low priority on the enforcement agenda, considering the multitude of quality issues with products that could impact human health and safety in China.

For MEPS, there is also no reporting mechanism on the compliance status of appliance products, making it difficult therefore to check and verify such status. In contrast, product registration and reporting is a key element of MEPS programs in US, Canada, and Australia.

For the mandatory information label, there is an application and paper review process, so energy performance information is reported by the manufacturers and collected by the label administrator, CELC. There is no regular audit program as in Australia, so it is not

⁹ Program details for each product can be found at www.energyrating.gov.au.

clear whether the energy information label is used or used properly. There is also no regular verification testing for the energy information label either, so it is not clear whether labeled appliance performance indices are accurate. CELC acknowledged, during the interviews for this project, that verification testing is critical to the integrity of the energy information label. However, it lacks funding to pursue these monitoring activities.

During the course of this project, CELC is conducting a limited verification testing on a small number of refrigerators and air-conditioners. This is a good start, but the verification testing effort needs to be significantly scaled up and regularized to have a meaningful impact. Further, the information label only covers these two products, thus the testing program for the label is not a sufficient check for all products under the MEPS program. However, the mandatory label for clothes washers and unitary air-conditioners will be launched in 2007.

The verification testing program for MEPS is inadequate, compared to best international practices. From 2001 to 2006, the three major household appliances were tested seven times in total: clothes washers were tested three times, and refrigerators and room air-conditioners were tested twice. Each time, 20 to 30 models were tested, representing about 1% of the total models available in the Chinese market. In comparison, the verification testing program run by ARI typically test 30% of the basic models.¹⁰ According to CNIS, the national verification testing program can be expanded if outside funding can be secured, since AQSIQ only has limited funding for this testing program. In the past, China's Green Lights Program has supported product quality testing for lighting products.

The sampling process for MEPS testing could also potentially weaken the robustness of the national production quality test. Currently, samples are taken by the implementing agencies designated by AQSIQ, typically one or more national laboratories, at manufacturers' warehouse on site. According to CELC, it is possible that some manufacturers could set up a dedicated warehouse for all testing programs, therefore undercutting the effectiveness of sampling. Manufacturers interviewed have discounted such a possibility. However, it seems that a market-based sampling approach targeted at the retail or wholesale channels would be more robust. CELC plans to conduct its verification testing for the energy information label based on samples taken at retail and wholesale outlets.

The basic infrastructure for appliance performance testing is in place in China, however, the technical capacities need to be improved to meet the challenge of a much expanded national verification testing program. There are three national testing laboratories that are accredited by the China National Commission of Accreditation (CNCA), and about 50 more local testing laboratories¹¹. The three key national testing laboratories which are located in Beijing, Guangzhou, and Hefei have shouldered most of the current testing for the national product quality test. They have strong technical capabilities and adequate

¹⁰ According to Peter Biermayer, unpublished manuscript.

¹¹ According to answer provided by CNIS to a questionnaire on test laboratories.

testing equipment. However, if the scale of the national testing program is significantly expanded, then their capacities may need to be expanded and strengthened as well. Given the geographic spread of the Chinese market, there is also a need to develop testing centers in other regions as well. Many testing laboratories affiliated with provincial government agencies do not possess necessary technical capacity to conduct performance testing for appliances on a consistent basis. Therefore, it is necessary to build their capacity before they can be recruited into the national testing program. Further, improving the consistency of test results between test laboratories is a critical and necessary step in setting up a comprehensive national testing program. This can be achieved through a round-robin test and capacity-building activities.

The penalties stipulated in the *Implementation of Standardization Law* are significant. For example, a fine worth 20% to 50% of the value of the products sold could be assessed and the offending products could be confiscated. However, application of actions does not seem to have often taken place. More often, AQSIQ publicizes the results of the test, and informs the provincial SBTS that enforcement actions should be taken against the offending manufacturers. The local SBTS then orders the offending manufacturers to “rectify the situation” so that their products will meet the requirement of MEPS. If the manufacturers fail to take appropriate actions to address the violations, then SBTS would impose fines and/or confiscate the offending products. However, representatives from manufacturers and the trade association at the roadmap workshop organized by CNIS indicated that manufacturers do follow through with corrective actions, and could not cite a case where fines were applied.

Interviews with the representatives of major appliance manufacturers reveal that bad publicity is an even greater threat to the manufacturers than the punitive financial penalties. Once notified of the performance issues in the national test, manufacturers will do “whatever is necessary” to meet compliance requirements. It seems that industry consolidation and competition in China’s appliance market has produced sufficient competitive pressure for major manufacturers to comply with the MEPS.

There is also clear procedure for manufacturers to dispute the test results for national product quality inspection test. Within 15 days of being notified of non-compliance, the manufacturer could ask AQSIQ in writing for a second test. AQSIQ would then ask the implementing laboratory to conduct a second test using samples that have been obtained in the initial round and reserved for such a purpose. CELC has similar procedures for manufacturers to challenge its testing results; however, has no experience so far, given that the results of its first tests for the energy information label are not finalized yet.

The key gaps between the current Chinese and international best practices are in the following areas: 1) there is no product registration and reporting requirement for MEPS; 2) though such a requirement is in place for the China Energy Information Label this covers only two products; 3) monitoring and verification of products performance are inadequate in China, both for the MEPS and the Energy Information Label and in particular limited by sample sizes too small to qualify for vigorous monitoring as well as a lack of attention to energy efficiency versus other issues such as health and safety; 4)

there is insufficient funding to undertake verification testing for MEPS and the Energy Information Label; and 5) the testing infrastructure in China is relatively weak in comparison with the need.

4 Stakeholder Feedbacks on Potential Improvements to the E&M System

On November 14, 2006, CNIS and CLASP organized a roadmap workshop with representatives from key manufacturers, testing laboratories, and industrial associations to discuss the current status as well as activities that could strengthen monitoring and enforcement efforts of China's appliance standards and labels. In general, the feedback from the stakeholders in this venue verified the findings from the comparison of China's M&E system with international best practice as noted in the section above. Specifically the stakeholders agreed that:

1. Monitoring and enforcement is rather weak for China's mandatory standards and labeling programs. There is inadequate verification and testing of reported appliance performance by manufacturers. This is especially true for the mandatory information label, since it largely relies on manufacturers' self-declaration.
2. For MEPS, due to limited government staff and budget, most of appliance products have rarely been tested under the national product quality inspection test. There are thousands of products covered under the national product quality test, and so testing priority is given to products with greatest threat to safety and health of consumers.
3. Even when appliance products are tested under this system, often time energy efficiency is not included in the list of performance benchmarks verified. Further, the sample size of the national product quality testing is too small, typically 20 to 30 models, according to the testing laboratories and CELC. Given there are thousands of models on the market, this sample represents 1% or less of the market. The chance of being included in the national testing is very slim. This is especially true for smaller manufacturers who have fewer models on the market and often sell to markets that are in smaller cities or rural areas. In addition, product models change quickly, so it is almost impossible to find and then test samples from these smaller producers.
4. While the three nationally accredited laboratories are technically competent, they are commercial laboratories whose business is to perform product testing for appliance manufacturers. As such, the objectiveness of testing results from them is not beyond doubt either. It has been argued that commercial laboratories would look favorably upon products from their major clients, and using publicly funded research laboratories could avoid such conflict of interests¹². CNIS is in the process of applying for government funding to set up its own laboratory to support the development and enforcement of appliance standards.

¹² Interviews with CNIS staff during the week of November 13, 2006.

5. However, there is also an indication that the national testing program presents a credible if modest threat to major producers. Given their visibility and multitude of product models, the large manufacturers are invariably selected in national product quality tests. The damage of potentially bad publicity is a huge liability to them, according to manufacturer representatives present at the workshop. These large manufacturers complain that small rivals are less accountable to the compliance regime and could undercut the competition by offering low-priced products with inferior quality and performance. They see the national testing program as a means to “clean up” such bad practices.

During the roadmap workshop, there was a consensus that verification testing for appliances should be significantly expanded and strengthened to cover more product types and a greater share of the models, in order to enhance the effectiveness of the appliance standards and labels in China. For example, it was proposed that the sample size for the national verification testing should be raised from about 1% of models now to 25-30% of the models available. This scaled-up compliance testing program could either be administrated through the current national product quality testing program or through the mandatory labeling program. Either way, it would require significantly more resources than currently available.

There are some key differences between these two approaches. On one hand, the mandatory label program has a dedicated administrator, CELC, who is ready to strengthen monitoring and verification of label compliance. Once resources are available, CELC could move very quickly to launch a national verification testing program, based on its existing relationships with testing laboratories and its internal registration database. Further, the sample is taken from retail and wholesale outlets, offering more realistic check on the performance of appliances.

On the other hand, the energy information label only includes a few appliances products, and by 2007 will cover refrigerators, room air-conditioners, clothes washers, and unitary air-conditioners. It may take some time for the label to expand to other appliances. The national product quality inspection test could theoretically cover many more products, and potentially has slightly lower testing costs, given that samples are provided by the manufacturers. However, the samples are taken from manufacturers’ warehouses, not at the retail and wholesale outlets, which could potentially introduce bias to the test results. A major expansion of the current national testing program could also encounter bureaucratic barriers in getting project approval from the relevant government agencies such as AQSIQ.

To improve the objectivity of the national product quality testing, CNIS suggested that enforcement agencies need to set up their own independent test laboratories to complement the existing network of test laboratories. These publicly funded laboratories could provide invaluable information to support the development of appropriate standards as well as serve as a quality control tool for test results from commercial laboratories. As the scale of national verification testing is expanded, more laboratories are likely to be involved. Maintaining the consistency and integrity of test results will become a critical

issue. Therefore, it is suggested that AQSIQ or CNIS initiates round-robin tests and educational activities to strengthen the capacity of new test laboratories and to improve the consistency of test results among test laboratories.

It was also suggested that non-government stakeholders could play an important role in monitoring and verification testing. The Chinese appliance industry has indicated willingness to participate. In the fall of 2006, 16 leading producers of refrigerator and room air-conditioners have set up an “Industry Honesty Alliance for Energy Information Label” to ensure compliance to the labeling requirement by members of the Alliance. Verification testing has been proposed for products made by Alliance members, but has not yet been implemented. The cost of testing will be supported by contributions from Alliance members. The China Household Appliance Association also showed interests in working with the standards and label programs to strengthen monitoring effort, however, it is not clear what role it may play. Chinese industry associations tend to be dominated by the largest manufacturers in the sector, and their objectivity on such quality or performance issues is not uniformly accepted, as a recent incidence involving China Quality Association demonstrated.

A successful testing program also depends on scoping out the universe of products from which representative samples could be drawn. At the moment, there is no complete national registry of appliance products on the market, nor is there any sales data by efficiency. Therefore, it was suggested that instituting a product registry and associated reporting requirement for the MEPS program, as is done in US and Australia for their MEPS and in China for the energy information label, could improve capacity for compliance monitoring. It was felt by some interviewees that retail partners could be a tremendous help in collecting such data, especially data on efficiency by sales. In addition, they can also help reduce the cost of sampling and in disposal of sample products after the test. CELC currently has developed relationship with a few large appliance chains to offer deep discount for the tested samples.¹³

Consumer associations have traditionally served as an advocate for consumer rights in China, for example, representing consumers victimized by fraudulent products against manufacturers or retailers. Occasionally, they have published investigative reports on false representations made by manufacturers, such as on a product label or sales promotion material. However, they have limited monitoring and verification capacity. According to stakeholders present at the roadmap workshop they could be very useful in disseminating the results of national verification testing.

5 Suggestions for Improvement and Next Steps

5.1 Vision Statement for a proposed monitoring and enforcement system in China

An effective monitoring and enforcement regime in China should strive to: ensure complete compliance to China’s mandatory appliance efficiency standards and labeling programs; protect consumer interests; and maximize energy savings of the standards and

¹³ Interview with Wang Ruohong of CELC, November 13, 2006.

labeling programs. Based upon this review, such a regime should include the following features:

1. A dedicated and integrated monitoring and enforcement agency with clear responsibility and adequate staff and funding;
2. A mandatory product registration and reporting system for all products covered under the mandatory standards and labeling programs;
3. An expanded and transparent verification testing program that includes all products covered under the mandatory standards and labeling programs;
4. A strong network of testing laboratories accredited by CNCA;
5. Credible penalties for non-compliance;
6. A clear procedure for dispute resolution; and
7. Encouragement of the participation of other stakeholders (e.g., industry associations, retailers, and consumer groups) to enhance the effectiveness of the monitoring and enforcement system.

5.2 Next Steps

While AQSIQ is nominally in charge of monitoring and enforcement efforts for appliance standards and labeling programs in China, lack of staff and funding has prevented it to perform either functions well. Compliance monitoring of minimum appliance efficiency standards has not receive proper attention, due to competing priorities. While compliance monitoring for the mandatory label is the purview of CELC, no government funding has been provided to carry out such effort¹⁴. Therefore, it is critical that AQSIQ allocate more staff and budget in order to strengthen the monitoring and enforcement effort.

Alternatively, AQSIQ could entrust the daily operations of monitoring and verification for the MEPS program to a dedicated and independent institution, such as CELC, while AQSIQ retains the enforcement authority. Doing so would integrate the monitoring effort for both the MEPS and the mandatory labeling program, reduce the cost of monitoring and testing, and avoid duplicate effort, since CELC is already responsible for compliance monitoring for the energy information label. In addition, CELC could help AQSIQ keep track of all the enforcement actions at the local level, ensuring that penalties or corrective actions are carried out properly.

At present, there is no reporting requirement for the minimum appliance efficiency standards, making it difficult to monitor the compliance status of regulated products. AQSIQ should initiate a product registration and reporting program for all products regulated by the MEPS program, just as the mandatory labeling program has. Many national appliance efficiency programs around the world have adopted similar procedures. Further, data collection could be combined with those administrated by CELC for the mandatory labeling program. Data collected through this process can be used in monitoring the trend in compliance and form the basis for verification testing. At present, energy performances of appliance under the mandatory label program are provided by manufacturers (self-certification). In the future, China could also consider certification of such performances by other certification institutions that are accredited by

¹⁴ CELC does not have enforcement authority for the mandatory label either, and has to refer any violations to AQSIQ for any enforcement actions.

CNCA such as China Quality Certification Center (CQC) and China Standards Certification Center (CSC).

Of course, the key to the successful enforcement effort starts with a much expanded national verification testing program that is persistent over time and covers all regulated products. The current national product quality testing program in China covers only a few appliance products, and sometimes, efficiency measurement is not even checked. The extent of sampling is very limited, covering about 1% of appliance models on the market, thus the chance of being caught in the national testing is very slim. A much expanded testing with a sampling rate of 10 to 25% would be a more credible threat.

Table 3: Cost estimates for expanded national verification testing

sampling rate	10%	25%
refrigerator model	2000	2000
room air-conditioner model	3000	3000
clothes washer model	2000	2000
total sample	700	1750
unit testing cost (RMB)	10,000	
total testing cost (RMB)	7,000,000	17,500,000

Funding requirement for such an expanded national testing program is significant. Table 3 above provides illustrative estimates of potential program costs, based on CELC's knowledge of testing costs, for three major household appliances: refrigerators, room air-conditioners, and clothes washers. The average unit testing cost includes costs of testing, sample products, shipping, and other labor costs related to sampling. This cost estimate is provided by CELC based on its current testing program for the mandatory label.

While the eventual program cost depends on sample size and products covered, these estimates are over 10 times higher than AQSIQ's current budget for the appliance testing program, which is about 500,000 RMB (7.8 million yen). Therefore, it is necessary to seek support from interested international donors. It is also possible that part of the increased cost could be covered through the CDM mechanism. Under the guideline for programmatic approaches, activities to strengthen policy implementation could be considered as CDM projects; therefore, the resulting carbon saving credits from such activities could then be sold to potential buyers to support these implementation activities. However, neither CNIS nor CELC has any experience in designing CDM projects, thus they will need outside assistance on CDM project design as well.

An expanded national verification testing would also require greater investment in the capacity of existing and new test laboratories, as well as in improving the consistence of

test results among laboratories. There are three national appliance testing centers at present. Given the size of China's appliance market and geographic spread, another three to five laboratories might be needed to support an extensive national verification testing program. Fortunately, there are many laboratories at the provincial level already, so the resources needed to improve their technical capacity would be less than building entirely new laboratories. Costs of laboratories vary by products and the nature of the test performed. For refrigerators and clothes washers, for example, the costs of establishing performance testing capacity are about 1 and 1.5 million RMB (15.6 to 23.4 million yen), respectively. The cost of performance testing capacity for room air-conditioners varies by the capacity of the tested air-conditioners, ranging from 2 to 5 million RMB (31.2 to 78 million yen)¹⁵.

All new or expanded regional testing centers need to be accredited by CNCA before they can be allowed to participate in the national testing program. Moreover, the three national testing centers could also take the lead in organizing round-robin tests and training seminars to improve the consistency of test results among test laboratories. This exercise could also benefit from participation of leading international testing laboratories.

While financial penalties are important, it seems that bad publicity may be a sufficient threat, to at least large manufacturers, according to representatives from two leading Chinese appliances manufacturers. Therefore, it is important to ensure a transparent testing program as well as making the test results widely available to the public, in order to put great pressure on manufacturers to conform to the standard and labeling requirements.

5.2.1 Implementation Plan

Based on feedbacks from the Chinese stakeholders during this research project, it is clear that an expanded national verification testing program is critical step in the improvement of China's monitoring and enforcement regime for the mandatory appliance standards and label. To ensure success to the expanded national verification testing program, the following activities should be taken:

A) Boosting the capacity of the China Energy Label Center as an administrator of monitoring and testing program, both for MEPS and China Energy Information Label
A strong and capable administrator is critical to the success of such a national testing program. Strengthening the capacity of CELC represents the best near-term opportunity, since CELC is already the administrator for the mandatory label and has an existing infrastructure to manage verification testing. This could involve staff training on program administration, data collection and analysis, information dissemination, and relationship building with key stakeholders.

B) Launching an expanded verification testing for products under the mandatory label.
Two new products are added to the mandatory label program in 2007: clothes washers and unitary air-conditioners, in addition to refrigerators and room air-conditioners. With

¹⁵ These cost estimates are provided by CELC, who is applying for government funding to build its own test laboratory.

METI support, CLASP could assist CELC to launch an expanded verification testing program in selected metropolis and provinces. The experience from this first round of testing could be helpful in developing the full scale national verification testing program.

C) Creating a national registry and reporting requirement for MEPS products

CNIS/CELC should create a national registry for all appliances products regulated by MEPS. This can build on the existing product database that CELC has developed for the mandatory label program. The combined registry creates a basic channel for collecting performance data for all regulated appliance products, and could be very helpful for the verification testing program.

D) Creating a certification requirement for all regulated products

The reporting of energy performance for the mandatory label is based on self-certification. China could move to a third-party certification approach to increase the confidence of such data, as is used widely in Canada and the US. Only accredited certification institutions by the relevant national authority would be allowed to issue such certification.

E) Developing a plan for expanded national verification testing

Assuming available funding, CLASP could assist CNIS/CELC develop a plan for ramping up the national verification testing over the next three to five years.

F) Identifying potential partners for regional test laboratories and developing appropriate capacity building plans

CNIS and CELC should identify potential partners among the current regional testing laboratories, and work with them to develop concrete plans for building new testing facilities and for staff training

G) Developing plans for improved consistency of test results

Assuming available funding, CLASP could assist CELC to plan for a round-robin testing, first among three national laboratories, and then expand this program to other regional test laboratories, with the goal of improving the consistency of testing results from different testing laboratories. CLASP could also facilitate the involvement of leading international test laboratories in this exercise. CELC could then develop training workshops after the round-robin tests to enhance the capacity of regional test laboratories.

5.2.2 Capacity Building Plan

Based on feedbacks from the Chinese stakeholders interviewed during this project, it is recommended that the following activities should be undertaken to strengthen the local capacity in implementing monitoring and enforcement actions:

a) Training of provincial SBTS staff

CNIS/CELC should develop training seminars to inform enforcement staff at local SBTS offices on the requirements of MEPS and the mandatory label for appliances and

industrial equipments, especially on newly enacted or revised standards and labeling criteria.

b) Strengthening the existing testing infrastructure

CNIS and CELC should work with both the national test laboratories and potential regional partners to identify needs for capacity enhancement in terms of additional testing facilities and launch a nationwide round-robin testing preferably with participation of leading international testing laboratories. CNIS and CELC should also organize training workshops for testing laboratories to build their capacity in conducting performance testing for appliances.

6 Conclusions

China has already developed a solid legal foundation and has key elements in place to support the development and enforcement of energy efficiency standards and labels. AQSIQ, as directed by the State Council, has clear authority to develop, promulgate, and enforce energy efficiency standards and labels for appliances. However, monitoring and enforcement effort for appliance efficiency standards and labels are grossly under-funded in China, especially compared with the need of the largest and perhaps most dynamic appliance market in the world. In addition, there are no reporting and certification requirements for products covered by MEPS, making it difficult to monitor the overall compliance situation. For the mandatory energy information label, the reporting requirement provides a very useful platform for the China Energy Label Center to collect product performance information, to provide public access to such information, and to keep track of the distribution of energy efficiency for refrigerators and room air-conditioners.

The limited funding for monitoring and enforcement effort has hindered the ability of program administrators to monitor the compliance status of appliance products in China. The only funded verification testing of the energy performance of regulated appliances so far is the national product quality supervision test. With a sampling rate of about 1% of the appliance models on the market, it has limited deterrence. Without adequate monitoring and verification testing, it is difficult to enforce the compliance to both the mandatory standards and labeling programs. Therefore, the critical next step, as agreed by many stakeholders interviewed during this project, is to significantly expand the national verification testing program.

Discussion with a variety of stakeholders in China indicates that the ideal form of a future monitoring and enforcement system in China should include the following elements:

- A dedicated and integrated monitoring and enforcement agency with clear responsibility and adequate funding;
- A mandatory reporting and certification system for all products covered under the mandatory standards and labeling programs;
- An expanded and transparent verification testing program that includes all products covered under the mandatory standards and labeling programs;
- A strong network of testing laboratories accredited by the CNCA;
- Credible penalties for non-compliance; and
- A clear procedure for dispute resolution.

While AQSIQ is responsible for monitoring and enforcing the compliance to MEPS and mandatory labels, its limited resource and staff hinders its effectiveness. It is recommended that the monitoring functions for MEPS and the mandatory energy information label be integrated and given to the China Energy Label Center, while AQSIQ retains the enforcement authority. Since CELC is already in charge of monitoring the compliance status to the mandatory energy information label, combining these

functions for both MEPS and labels programs would create synergy and reduce the cost of monitoring and enforcement.

For the expanded national verification testing program, CELC could serve as the program manager, while existing national testing centers and new regional testing centers would perform the actual verification testing. To support the expanded national verification testing program, there is also a need to improve the capacity of all testing laboratories through building additional testing capabilities and staff training. There is also a need to initiate a round-robin test on key appliances to improve the consistency of test results between national and regional testing centers. CELC could lead this effort with assistance from leading national as well as international testing laboratories.

There is a consensus among various stakeholders interviewed during the course of this research, (including representatives from manufacturers, program administrators, researchers, and testing laboratories) that expanded and persistent verification testing over time is the most effective approach to increase compliance to mandatory standards and labels and consequently energy savings of these programs. As China strives to achieve its 20% target for energy intensity reduction in the current Five-Year-Plan (FYP), maximizing energy savings from the appliance standards and labeling programs is likely to become one of the most prominent policy goals in China.

Appendix: Meeting Summary: Roadmap Workshop on Monitoring Mechanisms for Energy Efficiency Standards and Labels

China National Institute of Standardization
4 Zhichun Road
Beijing, the People's Republic of China

November 14, 2006

Participants:

For CNIS and CELC

Mr. Wang Ruohong, Deputy Director,

Mr. Cheng Jianhong, Senior Engineer

Mr. Liu, Engineer

For China Domestic Appliance Research Institute

Mr. Qi Bing, Deputy General Engineer

For China Refrigeration and Air-conditioning Industry Association

Mr. Shang Shiren, Deputy Secretary

For Beijing Polytechnic University

Mr. Li Hongqi, Professor

For Qingdao Haier Group

Mr. Gao Baohua, Division Director

For HiSense (Beijing) Appliance Corporation

Mr. Yang Zhanjun, Project Manager

For CLASP/Lawrence Berkeley National Laboratory

Mr. Lin Jiang

In order to standardize the use of energy efficiency label by the enterprises, and to facilitate the health development of the energy efficiency labeling and standards system, CNIS and CELC organized a roadmap workshop on monitoring and enforcement mechanism for energy efficiency standards and labels.

Mr. Wang Ruohong first introduced this year's work related to national supervision sample testing and market-based supervision testing for the mandatory energy information label: in the first half of 2006, AQSIQ conducted a special supervision sample testing covering 29 air-conditioner manufacturers, and energy efficiency indices of the information label are within the scope of the special sample test. CELC organized a market-based supervision testing for the information label in September 2006, and

purchased a total of 56 sample products of domestic refrigerators, freezers, and room air-conditioners in the markets in Beijing, Guangzhou, and Heifei. CELC contracted National Domestic Appliance Quality Testing Center, National Household Appliance Quality Testing Center, and National Compressor and Mechanic Cooling Appliances Quality Testing Center to test these samples. The testing is still ongoing. It is expected that the test results will be compiled before the end of the year. Wang Ruohong also described other activities that CELC will undertake in the near term.

Mr. Qi Bing, of China Domestic Appliance Research Institute, provided an introduction on the process of national supervision testing and national special sampling testing: national supervision testing is authorized by AQSIQ and conducted by accredited laboratories during the peak sale seasons for selected products; the number of samples is about 20 to 30 units for each product; and the cost of sampling and testing is about 100,000 to 200,000 RMB. Qualified products under the Exempted Products (effective for 3 years) and Brand Name Products (effective for 5 years) schemes are not within the scope of national supervision testing. However, the scope of the special national sample testing includes these Exempted and Brand Name products, but only special items – performance measures – are tested. All test results are publicized by AQSIQ. Disqualified products will be referred to provincial AQSIQ offices for affected manufacturers to take corrective actions (to come into compliance).

Dr. Jiang Lin of LBNL first briefed the participants the background of this workshop, and introduced the process of verification testing conducted by industry associations in the US, and reporting requirement by the US government agencies. It was suggested that round-robin testing be organized for test laboratories both within China and between Chinese and international laboratories to improve the confidence of test results and work toward mutual recognition of test results. Training activities were also discussed to improve staff capacity in conducting performance testing.

Mr. Shang Shiren introduced the proposed supervision testing under the Industry Honesty Alliance program, in which participating manufacturers will pay for testing and results are publicized.

Other participants also offer their analysis of China's current supervision testing mechanism, and agreed that market-based check testing is the weak link. Both the national supervision testing and Alliance initiated testing are conducted based on samples taken from manufacturers, and there are sometimes differences between products on the market and in the warehouses. Consumers don't have the capacity to test the performance of appliances. It was hoped that government or public certification and management institutions undertake these tests. Larger manufacturers also hope such testing would "clean up" the market, and level the competitive playing field, fully utilize the market transformative power of the information label, and strongly penalize unqualified products and misbehavior.