What Works in Enforcement and Compliance: Experience with the Local Supervision System for China's Energy Label

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ABSTRACT

The China Energy Labeling System is one of the major elements of Chinese government policy seeking to manage energy consumption of domestic, commercial and industrial products. Mandatory labeling began in March 2005. Since this time there has been an expansion of product coverage and a strengthening of the labeling and registration system. As a result, the system is now considered relatively robust. However, there is a perception that the supervision and inspection process used to enforce the labeling system has a number of serious issues that have the potential to undermine the overall integrity of the system and limit the resultant energy savings.

Between 2009-2011, the China Energy Labeling Centre initiated a pilot supervision project in 5 representative regions in an effort to research the key shortcomings of the existing supervision system, and to make recommendations for actions to improve the system and protect the integrity of the national labeling program. During the two-phase research period, specialized label supervision was undertaken to check the appropriate product registration/use of the label, and some of the associated products were check-tested to establish if the data displayed on the label corresponded with actual product performance. In parallel the supervision *process* was monitored to indentify flaws in design and barriers to effective implementation.

This paper provides:

- the background to the China Energy Labeling System.
- the perceived issues with the existing labeling supervision process.
- a summary of the methodology used in the research.
- the outcomes of the research into the supervision *process* and the compliance rates for various products/locations established through the supervision process.
- a summary analysis of the results.
- a comprehensive listing of recommendations to improve the labeling supervision system and some actions already underway to increase overall program integrity.

Keywords

Evaluation, Measurement, & Verification (EM&V); Appliance labeling; Equipment labeling; Market supervision

Energy Standards and Labeling in China

Context

China is experiencing explosive economic growth and rapidly rising living standards. Not surprisingly, this growth is being accompanied by increasing energy consumption. However, the combination of a need to maintain economic competitiveness, the pressing issue of energy security in a resource constrained world, and environmental sustainability have all increasingly focused government attention in this area. Consequently, China has committed to building a "resource-saving and environmentally friendly society". This is evidenced by *China's Law on Energy Conservation* (SCNPC, 20007) which states "insist on energy development with conservation while giving first priority to the latter". It is this law which frames China's overall energy strategy. Further evidence of the increasing government commitment to this area is given by the progressively stronger language used in the Five-Year Plans for National Economic and Social Development that guide government all policy at the national, provincial and local level:

- *10th Five-Year Plan (covering 2001-2005)* (State Council, 2001): "insisting on energy development with conservation while giving first priority to the latter".
- *11th Five-Year Plan (covering 2006-2010)* (State Council, 2006): "insisting on energy development with conservation while giving first priority to the latter", "implementing the basic national policy of resource-saving and environmental protection" and "encouraging initiatives in the production and use of energy-efficient products.".
- *12th Five-Year Plan (covering 2011-2016)* (State Council, 2011): "implementing energy-conservation as a priority strategy" and "considerably improving the utilization ratio of energy resources".

While to the western eye and culture these are rather strangely constructed phrases, the increasingly robust intent is clear and is made fully transparent by the commitment in the *12th Five-Year Plan* to decrease energy consumption per unit GDP by 16%, and reduce the CO_2 emission per unit GDP by 17%. Within this overall strategic context, improving the energy efficiency of end-use products is a critically important component.

China has established a relatively robust policy framework for improving the energy efficiency of end-use products through the elimination of high consuming products from the market, and the active promotion of high efficiency alternatives. Within this framework, tools used include:

- Issuing lists of high energy-consuming products to be eliminated from the market either through standards development and/or through mandatory restrictions on sale/purchase/installation.
- Implementing minimum energy efficiency (and other product performance) standards and energy labels.

- Mandatory government procurement of higher efficiency products.
- National financial subsidy programs providing significant financial incentives to domestic, commercial and industrial consumers (and motor vehicle purchasers) to purchase specified higher efficiency products.

Among these measures, energy efficiency standards and labeling (ES&L) have developed rapidly and have become one of China's most cost-effective energy management measures.

Summary of Standards and Labeling Progress to Date

To date, China has released 48 energy efficiency standards (two of which have since been abolished) and has implemented mandatory energy labeling of eight batches of products. The labeling program encompasses 25 individual product types including household and industrial appliances, lighting, and commercial and office equipment. Using the Long-range Energy Alterative Planning System (LEAP) model, an analysis evaluating the impact of ES&L in China on the 19 main product types (including air-conditioners, refrigerators, electric motors, air compressors and compact fluorescent lamps) shows a total electricity saving of 700 billion kWh in the years between 2000 and 2011 (CNIS, 2011). This electricity saving has resulted in primary energy savings equivalent to 250 million tons of standard coal, and the mitigation of emission of 650 million tons of CO_2. These savings were a major component in the realization of the goal of the *11th Five-Year Plan* (State Council, 2006) to decrease energy consumption by 20% per unit GDP decrease (and reduced emissions of other major pollutants by 8-10%).

The China Energy Labeling System and Organizational Structure

The China Energy Label System (CELS) is based on manufacturer self-declaration, label registration and market supervision. Manufacturers and importers are required to submit product information (including supporting test data from a registered laboratory) to the China Energy Labeling Centre (CELC). CELC then conducts a verification process prior to issuing registration.

Laboratory registration is also conducted by CELC and requires laboratories to register their testing capabilities, and then undergo verification including an on-site inspection of management system documentation, testing facilities and abilities, and participation in annual round robin testing.

CELC is the agency authorized to implement CELS (CELC is part of the China National Institute of Standardization (CNIS)). CELC is responsible for identifying potential products for labeling, undertaking economic and technical studies on the products, development of labeling implementation rules and performance standards, registering of products and laboratories, and training and promotional activities.

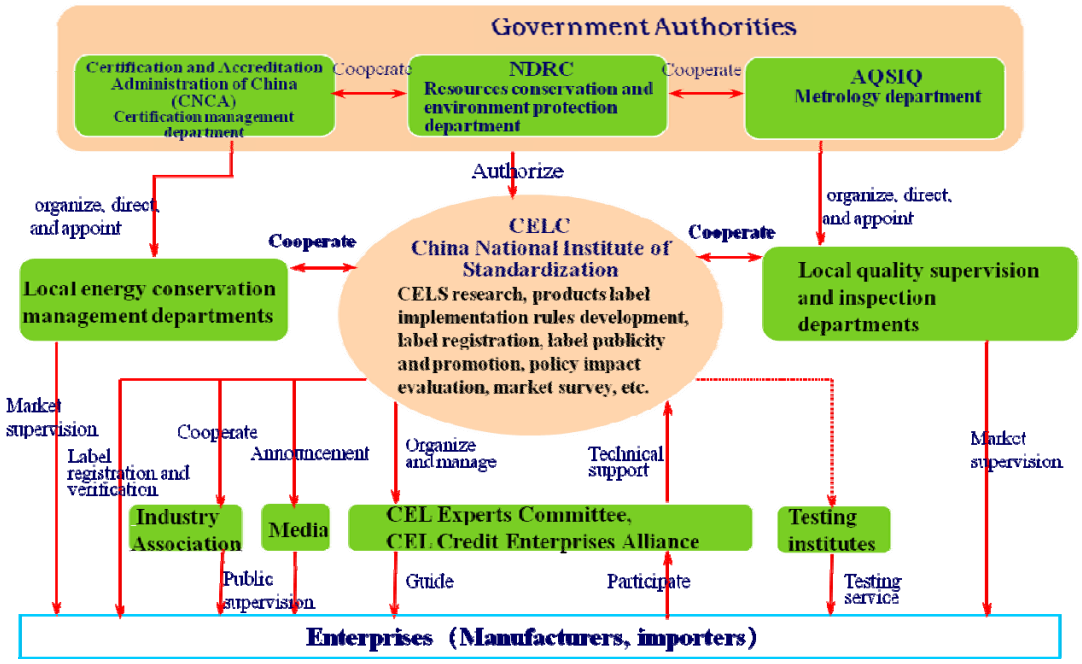
CELC is authorized to undertake these activities by a triumvirate of government departments lead by the National Development and Reform Commission (NDRC). The two other partner departments are the China Administration of Quality Supervision, Inspection and

Quarantine (AQSIQ), and the Certification and Accreditation Administration of China (CNCA). CELC is given additional guidance and technical support by the China Energy Label (CEL) Experts Committee and CEL Credit Enterprises Alliance

AQSIQ (and their provincial and local subsidiaries) and local energy conservation management departments are in charge of conducting national and local market surveillance on label use and accuracy, and to issue appropriate penalties for non-compliance. Surveillance is normally conducted at the factory at time of manufacture, but occasionally at retail outlets.

The overall CELS organization hierarchy and associated responsibilities are illustrated in Figure 1.

Figure 1. Organization and Implementation System of CELS



Energy Labeling Compliance and Market Supervision

Ever since the establishment of the CELC, China has studied experience from major countries and adopted measures to promote label compliance. As early as 2005, China began requiring the central registration of claimed label information as noted above. The requirement for registration of laboratories that provide documentation supporting labeling became mandatory in 2009. Despite this relatively robust implementation mechanisms developed for the CELS, and the remarkable results achieved in such a short period, manufacturer self declaration of product performance still leaves the opportunity for falsification of performance declarations, the use of labels that report false information, or the complete absence of labels at the point of sale. China has an established a system of national and local market supervision that is used to try and address the potential abuse of the product labeling system. Unfortunately, this is somewhat complicated in structure and operation which is leading to shortcomings in enforcement.

The Current Market Supervision System and Existing Issues

The Energy Conservation Law of the People's Republic of China (SCNPC, 2007) and the *Management Measures of the China Energy Label* (AQSIQ & NDRC, 2005) specify penalty provisions for violations, which set the legal basis for CEL supervision.

National label supervision and inspection is organized by AQSIQ, with local label supervision and inspection organized by their provincial, municipal and county-level departments. The quality supervision departments at each geographical level are run by the corresponding local government, but the supervision activities are guided and monitored by the quality supervision department at the next higher level in the AQSIQ hierarchy. In addition, the actual check-testing of products to ensure compliance with performance requirements (and registered label data) must be undertaken by testing institutes that conform to requirements defined in the *Product Quality Law of the People's Republic of China* (SCNPC, 2000). China has established thousands of these national, municipal, and county-level institutes for product quality inspection and check-testing. Consequently there is thought to be a lack of clarity in the roles and responsibilities between different departments, and huge variability in organizational structure, human resources, supporting management and technical documents, etc.

Further, traditionally national and local supervision and inspection has mainly focused on parameters such as safety and EMC performance, with little effort devoted to evaluating the energy efficiency of products.

Hence, because of the complex organizational structures, the variability of human and physical capacity from district to district, and the historical focus on check-testing for safety and EMC, there is no effective national system for label supervision and inspection. Which clearly raises the question, how can the labeling supervision system be improved to ensure the credibility, integrity and effectiveness of the CELS?

Researching Potential Improvements to Labeling Supervision Through Observation and Intervention in the Supervision Process in Pilot Areas

In an effort to find ways to improve the labeling supervision system, CELC initiated a pilot program on local energy label market supervision and label publicity and promotion in five provinces/cities, Shanghai, Sichuan, Shandong, Jiangsu and Guangdong. During the pilot, CELC facilitated local quality supervision and inspection bureaus and institutes to research the local energy label supervision systems and to conduct market supervision activities including specialized inspection of the label.

The pilot began in 2009 and ran for three consecutive years under the guidance of AQSIQ and with the support of the Energy Foundation and the Collaborative Labeling & Appliance Standards Program (CLASP).

The pilot work covered ten product types, nine types of widely-used household appliances and one mainstream lighting product as shown in Table 1. The selection of target products was

based on their local prevalence in the market, local production, sampling and transportation convenience, and the testing abilities of laboratories. In order to ensure that the pilot work was strongly representative of the country as whole, product sampling covered large, medium, and small manufacturers in economically developed cities, under-developed cities, and rural areas.

Methodology

The local energy label supervision consisted of two parts, specialized label usage inspection, and energy efficiency check-testing. The former focused on checking manufacturers' compliance in using and implementing the energy label (including the status of label registration, printing and pasting on the unit, etc). The latter focused on verifying the compliance of a product's actual energy performance with its claimed energy efficiency parameters as marked on the energy label.

Table 1. Target Products for Label Supervision and Inspection

Pilot provinces/ cities	Target products in phase I (2009-2010)	Target products in phase II (2010-2011)
Shanghai	Refrigerator, variable frequency air conditioner, computer monitor	Refrigerator, room air conditioner, induction cooker
Sichuan	Compact fluorescent lamp, electric motor	Compact fluorescent lamp, electric motor
Shandong	Electric motor, refrigerator, induction cooker	Electric motor, refrigerator
Jiangsu	Room air conditioner, compact fluorescent lamp, electric water heater	Room air conditioner, compact fluorescent lamp, electric water heater, induction cooker
Guangdong		Electric rice cooker, induction cooker, electric water heater

Specialized inspection. The label usage inspection verified the following items:

- Whether manufacturers had applied for, and passed, label registration by CELC and the registration was an open publication on www.energylabel.gov.cn.
- Whether manufactures had pasted the correct label to their products and had appropriate management guidelines on their usage.
- Whether labels were pasted in the required position and if their design conformed to the requirements indicated in energy label implementation rules for each target products (CNIS, Various).
- Whether the product energy label information was consistent with product nameplate information.

Check-testing. Prior to the actual check testing process, sampling procedures were agreed for the selection of products, and appropriate documentation developed and government announcements made.

- Sampling principles:
    - Products were sourced from a combination of factories and retailers. Factory sampling was given priority due to enforcement powers available to the majority of local quality supervision and inspection departments.
    - Models were selected with:
        - Priority to those with styles and energy efficiency levels typical of the market.
        - Were manufactured in recent years and should be representative of much manufacturers and product series as possible (no more than one sample set can be drawn from the same product series, or two sample sets from the same manufacturer).
    - Individual test samples within the model range were selected at random.
- Governmental and technical documents prepared/reviewed, and associated announcements:
    - Official document on conducting label supervision work issued by the local quality supervision bureau.
    - Sampling and check-testing or retesting announcements for manufacturers.
    - Sampling form.
    - Product seals for selected samples.
    - Record form for specialized inspection of the label and issuing confirmation notices for the manufacturers regarding samples for check-testing.

Phasing of the Supervision/Research

CELC's pilot research was conducted in two phases during 2009-2011. Phase I covered four provinces/cities, Shanghai and Jiangsu (in eastern China), Shandong (in northern China), and Sichuan (in central China). Phase II covered the previous four locations and newly-added Guangdong province (in southern China). The selection of the locations was based on their geographic distribution as well as the existence in each city of an active market for household appliances and local manufacturers participating in the energy labeling program.

Responsibilities of Organizations during the Supervision/Research

The responsibilities of the participants were as follows. CNIS (CELC) was the organizer of the pilot research. Their responsibilities included:

- Drafting organization and implementation agencies' duties, sampling and testing procedures, assessment of test results, handling of samples after testing, penalties for non-compliance, etc. Procedures followed the *Administrative Measures for National Products Quality Supervision* (AQSIQ, 2010) and the *Inspection and the Implementation Norm for Products Quality Supervision and Inspection* (AQSIQ,

Various) issued by AQSIQ, and were based on relevant products standards and energy label implementation rules.
- Statistical analysis of pilot results;
- Leading the organization of training of CEL enforcement officials, and directing promotional activities;
- Assisting and guiding local quality supervision departments in improving local label supervision system and developing relevant management measures and regulations.

Provincial product quality supervision and inspection bureaus, and their subordinate inspection and testing institutes were the implementing agencies of the pilot work. The former was in charge of issuing government announcements related to conducting label supervision and inspection. The latter was in charge of actual implementation of the label supervision and inspection work; reporting results to their superiors; conducting training and promotion activities for label enforcement officials; and providing suggestions for improving the local label supervision systems, management structures and regulations.

The full label supervision procedure is detailed in Figure 2.

Summary of Labeling Specialized Inspection and Check-Testing Compliance Results

Table 2 and Table 3 provide a summary of the results from the two phases of *specialized inspection*. A brief review of the results is as follows:

- Overall, economically developed provinces/cities (Jiangsu, Shanghai, and Guangdong) show excellent results, with 100% of products having qualified labels attached to products, a much better scenario than in partially-developed Shandong province (60%, 86%, etc.) and undeveloped inland Sichuan province (25.2%, 57.7%, etc.).
- Looking specifically at household appliances (refrigerators, electric heaters, air-conditioners and induction cookers), there is 100% compliance with the required label usage regulations in all pilot cities, regardless of their economic development levels.
- Electric motors show unsatisfactory results in partially-developed Shandong, and worst still in undeveloped Sichuan.
- CFLs have100% compliance with labeling regulations in Jiangsu, but show much worse compliance in undeveloped Sichuan (25.2%).

Table 6 and Table 7 provide a summary of the results from the two phases of *check-testing* (note that this check-testing only examined the product performance compared with data displayed on the registration/label, *not* overall manufacturer declarations). A brief review of the results is as follows:

- Overall computer monitors and most household appliances (fixed and variable speed air conditioners, electric water heaters and rice cookers) show satisfactory manufacturer compliance with declared testing parameters. By contrast, CFLs, refrigerators, electric motors and induction cookers show much poorer compliance with labeled data. Given the inappropriate label usage for CFLs and electric motors evident in the specialized inspection results above, it is not surprising to see a coincidental lack of compliance for these products. However, poor label compliance for refrigerators and induction cookers is unexpected.
- Jiangsu and Guangzhou show good overall label compliance, while Sichuan shows unsatisfactory compliance of CFLs and electric motors, Shandong of induction cookers and refrigerators in Shanghai. Again overall, for the same product in different areas, economically developed provinces/cities show better compliance than less developed areas.

Figure 2. Flow-chart of Label Supervision

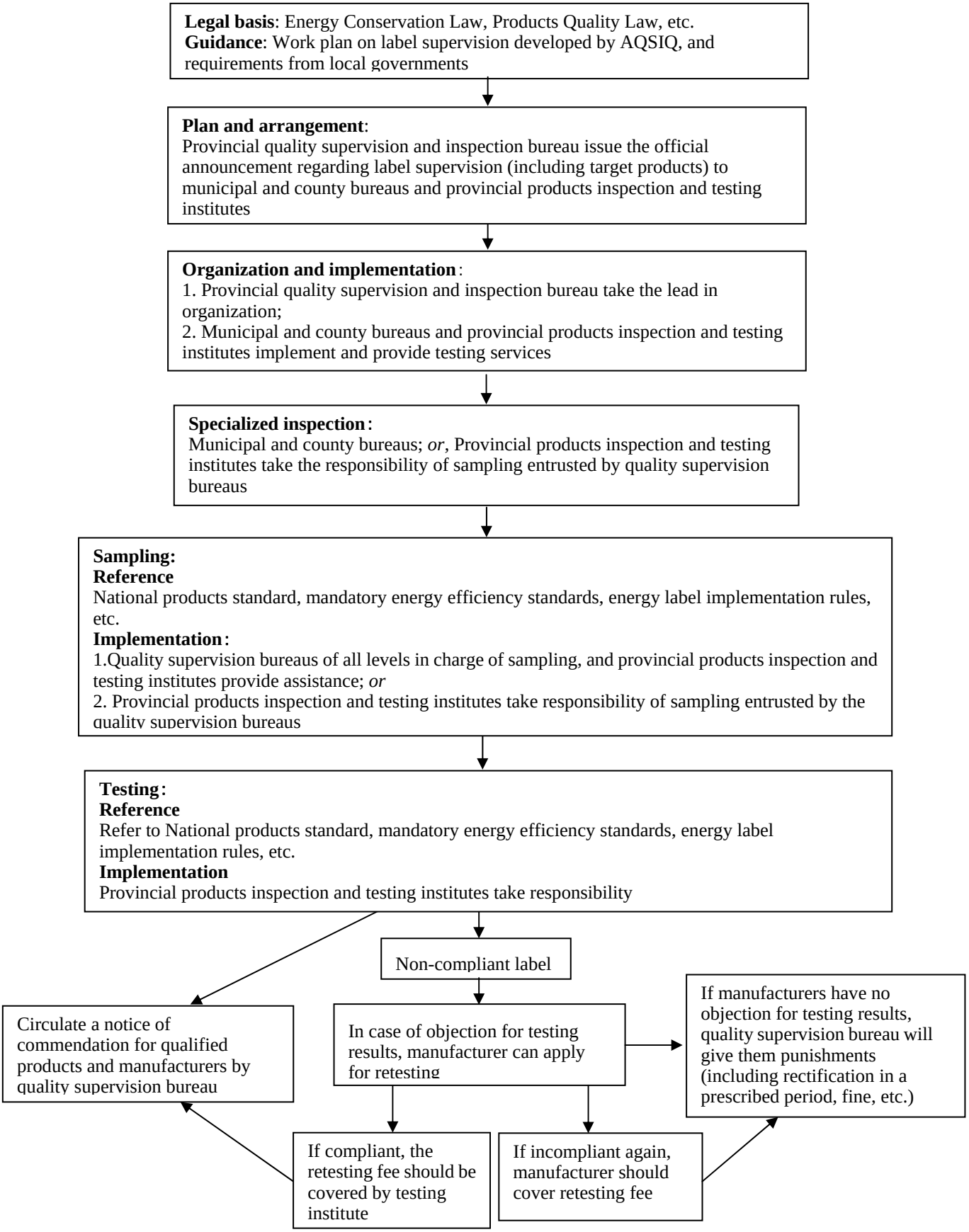


Table 2. Specialized Inspection Results for Project Implementation Phase I (2009-2010)

Product	Jiangsu		Sichuan		Shandong		Shanghai	
	Passed batches/ total batches inspected	Pass Rate (%)	Passed batches/ total batches inspected	Pass Rate (%)	Passed batches/ total batches inspected	Pass Rate (%)	Passed batches/ total batches inspected	Pass Rate (%)
Room air conditioner	7/7	100%						
Self-ballasted fluorescent lamp	16/16	100%	30/119	25.2%				
Electric water heater	6/6	100%						
Three-phase asynchronous motor			15/26	57.7%	6/10	60%		
Induction cooker					5/5	100%		
Domestic refrigerator					3/3	100%	8/8	100%
Convertible frequency air conditioner							6/6	100%
Computer display							10/10	100%

Note: "Batch" is used to describe all the samples used in the supervision work related to a single model. For example, CFLs may require 10 lamps for a single "batch" in the test protocol. In the case of other products, only a single unit may be required. The specific requirements are detailed in the relevant regulations developed by AQSIQ,(AQSIQ, Various).

Table 3. Specialized Inspection Results for Project Implementation Phase II (2010-2011)

Product	Jiangsu		Sichuan		Shandong		Shanghai		Guangdong	
	Passed batches/ total batches inspected	Pass Rate (%)	Passed batches/ total batches inspected	Pass Rate (%)	Passed batches/ total batches inspected	Pass Rate (%)	Passed batches/ total batches inspected	Pass Rate (%)	Passed batches/ total batches inspected	Pass Rate (%)
Room air conditioner	6/6	100%					10/10	100%		
Self-ballasted fluorescent lamp	16/16	100%	30/121	25%						
Electric water heater	7/7	100%							13/13	100%
Three-phase asynchronous motor			15/67	22%	6/7	86%				
Induction cooker	8/8	100%					20/20	100%	25/25	100%
Domestic refrigerator					6/7	86%	10/10	100%		
Automatic electric rice cooker									80/80	100%

Table 6. Check-testing Results for Project Implementation Phase I (2009-2010)

Product	Jiangsu		Sichuan		Shandong		Shanghai	
	Passed batches/ total batches check-tested	Pass Rate (%)	Passed batches/ total batches check-tested	Pass Rate (%)	Passed batches/ total batches check-tested	Pass Rate (%)	Passed batches/ total batches check-tested	Pass Rate (%)
Room air conditioner	7/7	100%						
Self-ballasted fluorescent lamp	14/16	88%	30/119	25.2%				
Electric water heater	6/6	100%						
Three-phase asynchronous motor			15/26	57.7%	10/10	100%		
Induction cooker					3/5	60%		
Domestic refrigerator					3/3	100%	4/8	50%
Convertible frequency air conditioner							6/6	100%
Computer display							10/10	100%

Table 7. Check-testing Results for Project Implementation Phase II (2010-2011)

Product	Jiangsu		Sichuan		Shandong		Shanghai		Guangdong	
	Passed batches/ total batches inspected	Pass Rate (%)	Passed batches/ total batches inspected	Pass Rate (%)	Passed batches/ total batches inspected	Pass Rate (%)	Passed batches/ total batches inspected	Pass Rate (%)	Passed batches/ total batches inspected	Pass Rate (%)
Room air conditioner	7/7	100%					10/10	100%		
Self-ballasted fluorescent lamp	12/16	75%	12/30	40%						
Electric water heater	6/6	100%							11/13	85%
Three-phase asynchronous motor			13/15	87%	7/7	100%				
Induction cooker	7/8	88%					16/20	80%	24/25	96%
Domestic refrigerator					6/7	86%	7/10	70%		
Automatic electric rice cooker									79/80	99%

Analysis of Potential Causes of Differing Compliance Rates

The levels of compliance with label use and product performance relative to label declarations vary significantly between region and product type. The *probable* causes of the variations are detailed below:

Differences in industry structures and stages of development. The household appliance industry has a long tradition of government support. The resulting industry is now dominated by

large scale manufacturers with well developed sales channels. Throughout the long development of the sector, both manufacturer and sales channels have been exposed to extensive surveillance of compliance and so the awareness of labeling requirements within the sector is high. Hence, the combination of industrial technical capacity and knowledge of the requirements for compliance mean there is little surprise that the rate of compliance for domestic appliances is high for both the appropriate application of the correct label, and product performance that aligns with the labeling claims. The one significant outlying result for domestic appliances is the poor compliance rate for refrigerators in Shanghai where check-tested for the alignment of product performance with actual label claims was poor. This is discussed below.

In comparison, electric motors and CFLs have a much more diverse manufacturing base. To take CFLs as an example, due to low initial capital outlay on manufacturing equipment, and the relatively low levels of technical knowledge necessary to produce the lamps, there are several hundred manufacturers, but only 25 with annual output exceeding 50 million units. Further, electric motors and CFLs have diverse sales channels which vary from upscale shopping centers to rural bazaars. In the lower cost, less developed end of the retail chain, the market regulation (for safety, EMC and other product performance) has historically been particularly poor. Hence, the lack of exposure to market surveillance actions at the retail end of the chain, and the targeting of information on labeling requirements made more challenging by the greater abundance and diversity of producers, have combined to result in the poor compliance outcomes for both CFLs and motors.

Differences caused by geographic variation and associated economic development. The differences in economic development in each region is obviously having an impact in three ways. Firstly consumers in less developed regions have had much less exposure to information on labeling, either through promotional activity by implementers such as CELC, or through labels on products themselves (there are fewer outlets offering smaller product ranges due to the lower potential for sales). Hence consumers in less developed regions do not act negatively if the label is not displayed, and so the demand pull from the consumer for products to display labels is not in evidence as it is in more developed regions. The second reason is less developed regions are generally home to the smaller manufacturers and have less advanced communications so, as noted above, they are less aware of the labeling requirements and less likely to take appropriate compliance actions. The final reason for poorer compliance in less developed regions also relates to the smaller scale of producers, but is actually an issue with the sampling process used. Due to the preference (and in many cases legal limitations) of local enforcement bodies, most of the products subject to the supervision were sourced from manufacturers rather than retail outlets. For example, samples of CFLs in Sichuan were mostly obtained from small manufacturers in rural areas. Thus, in less developed regions there will be a skew towards products produced by smaller manufacturers, a bias that may not be so significant in the actual retail environment.

Manufacturer exaggeration of claims. A number of products displayed labels that aligned with the information registered in the CELC system, but did not perform as claimed when tested. This

could be due to poor production/quality control allowing manufacturer of units that are outside appropriate tolerance levels for specific designs. Alternatively, it could be due to manufacturers exaggerating claims and/or falsifying documents (eg test reports) at the time of registration to enable labels to display the exaggerated product performance claims. At this stage it is impossible to be sure which is the case, and there is a likelihood that it is a mixture of both. However, due to the surprisingly low levels of compliance for refrigerators in Shanghai, CELC conducted a (confidential) internal analysis of the energy label registration database. This analysis identified a number of products with declared electricity consumption parameters that were *significantly* lower than would be expected for the specific product type/size. This indicates that, for refrigerators at least, there is likely to be an issue with exaggerated manufacturer claims and/or document falsification and action needs to be taken to strengthen compliance in this area.

Summary of Results from the Research/Intervention into the Supervision Process

It is clear that in almost all regions there are issues that hamper the *process* of effective supervision. However, due to the limitations of space within the paper, it is only possible to provide a summary of key the issues identified across all pilot regions (although most issues apply in all areas to a greater or lessor extent). The summary includes:

- There are significantly differing levels of awareness among regional implementers (government officials, testing agencies, manufacturers, etc) of the requirements for labeling and the associated compliance/supervision requirements.
- Where there is an awareness of labeling requirements, there is still variance in awareness of the importance of supervision to ensure the integrity of the CEL system, and hence varying levels of focus applied to supervision.
- In a number of regions there is human capacity issues, with local supervision agencies often lacking sufficiently detailed knowledge of the CEL process, registration requirements, and the associated supervision procedures. Hence there is a reticence to undertaken supervision. This situation is made worse by a lack of technical support at the national level (eg there are shortcomings in the enquiry system for searching the registration database).
- There lines of responsibility for implementation of CEL supervision a very unclear, both within individual organizations at the national, provincial and local levels; and between organizations at each level (however, it should be noted *legal* responsibilities actually vary at the provincial and local levels due to the specific laws and regulations in force and so a “one size fits all” solution is not necessarily appropriate).
- There are a numbers of areas where the national laws and regulations, and local implementation procedures, are poorly drafted and are consequentially ambiguous (for example, the *Administration Measures of the China Energy Label* (AQSIQ & NDRC, 2005).

- When supervision activity has actually taken place, the mechanisms for sharing outcomes of the supervision and inspection is poor. Information is circulated among a very limited group of product quality supervision and inspection bureau. To enable full use of the available information, and to ensure enforcement actions are taken appropriately, outcomes of supervision should be circulated to commerce inspection departments which have strong penalty powers related to market supervision activities; to product quality supervision and inspection bureau in other provinces; and particularly to CELC to enable identification of potentially issues with the CEL process, or individual manufacturers/ products.

Recommendations from the Research and Pilot Supervision, and Actions Already Undertaken

Experience gained from this pilot research has provided useful lessons for future energy label supervision and inspection efforts. The following measures are recommended for adoption to strengthen the integrity, and consequentially the impact, of the CELS:

- There should be increased levels of communication with industry to ensure their awareness of, and the requirements for compliance with, the CELS. This is particularly necessary in industries where there is a diverse/small-scale manufacturing base and/or in less developed provinces where traditional communications have failed to reach target groups. This may extend to increased manufacturer integration into the process for developing labeling and supervision regulations.
- Increased communications is required with regional government officials to raise awareness of the importance of CELS and the associated requirements for supervision to ensure political support for implementation (and to assist with resolution of specific local issues). Following this initial awareness raising, efforts should be made to incorporate energy label supervision and inspection into local law enforcement norms and to institutionalize processes.
- There is a need to provide increased technical training and support to regional and local implementers (in particular regional quality supervision and testing centres) to ensure they are aware of the CELS requirements, and have the knowledge necessary to undertaken the supervision process.
- Quality supervision departments and industry and commerce inspection departments at all levels should increase cooperation to benefit from resource sharing opportunities and complementary outcomes. Supervision and inspection should be diversified with emphasis on multi-stakeholder interactions.
- The national registration database needs modification to allow easier data acquisition by local supervision implementers, and also to highlight *potential* false claims at time of registration to allow for further investigation of the application.

- A reporting system needs to be developed that enables supervision and inspection results to be shared between market regulators and technical support institutions at all levels.
- There needs to be amendments to laws, regulations and implementing procedures to provide clarity in actual requirements and responsibilities.

Unfortunately, at this stage it has been impossible to provide an estimate of costs to implement all the recommendations detailed above. However, activity is already underway to begin the implementation of some of the recommendations including:

- Based on the project experience and results from previous undertaken supervision and inspections, the five pilot provinces have developed drafts of the *Administrative Measures on Local Energy Label Supervision and Inspection*, which include (but are not limited to) energy label specialized inspection and check-testing programs, as well as daily energy label monitoring and management programs. The drafts have been submitted to their respective provincial governments for approval. However, the provincial legislative procedures are complex and require, among other actions, deliberation and passage in People's Congress in each pilot province. Thus the process is still ongoing.
- Some pilot cities have incorporated daily energy label supervision and inspection programs into annual law enforcement plans in their local area. For example, Sichuan Province incorporated energy label supervision and inspection into its annual provincial regular supervision plan in 2011, and also expects to conduct *at least* one random label inspection of each local manufacturer every year.
- Beyond the pilot regions, CELC (through CNIS), and participant local quality supervision and inspection departments, are actively promoting the establishment of a nationally coordinated energy label supervision and inspection system and management mechanism. Potentially as a consequence of this activity, Premier Wen Jiabao included the requirement to conduct nationwide label supervision and inspection as part of the 2012 government work report (State Council, 2012). Consequently, AQSIQ plans to make greater progress to perfect the energy label supervision and inspection system.
- During 2010-2011, large-scale training was undertaken in 7 cities in (non-pilot) provinces by the CELC, with support from the pilot city quality supervision and inspection departments. The training covered an introduction to the CELS, an explanation of the *Administration Measures of the China Energy Label* and other related laws and regulations, and a detailed explanation of energy efficiency standards and energy label implementation rules. There was extensive exchange of practical implementation experience brought by the representatives from pilot cities. Over than 500 people from quality supervision and inspection bureaus (and their subordinate testing institutes) and energy conservation supervision centers participated in the activities.

- The registration system has now been modified to automatically monitor applications and signal products that display surprisingly good efficiency levels prior to confirmation of the registration. These products now have to undergo additional testing by an independent, qualified laboratory specified by CELC.

Overall, the research project and pilot activities have effectively identified issues, the resolution of which will significantly improve the energy label supervision system and the overall integrity and outcome of the CELS. Activities are already underway to implement the recommendations, however most are limited to the pilot cities. There is now a need to promote the outcomes of this study, and to implement recommendations more widely. Therefore Phase III of the project has just been initiation, and on completion, it is expected to substantively encourage local areas to institutionalize energy label rules, regulations, and enforcement, thus achieving an important breakthrough for the CELS.

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