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The Research on China' s Energy Efficiency Standards Implementation and Monitoring System

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Foreword

The implementation of energy efficiency standards (EES) and energy labeling system, due to its apparent advantages such as less investment, quick effects, great influence on energy conservation and environment protection etc., has been recognized by many nations' governments. According to statistics made by the International Energy Agency (IEA), until September 2004, totally 44 countries and regions have established and implemented EES and energy labeling system.

Since 1980s, up to now China has enacted over 20 mandatory energy efficiency standards. Related certification system for energy conservation products has been implemented since 1998, and energy labeling system for household refrigerators and room air conditioners was officially launched on March 1, 2005.

In order to facilitate EES play a better role and, establish and perfect an EES implementation and supervision mechanism in our country, China National Institute of Standardization brings forward the project of "Research on EES Implementation and Monitoring System". The purpose is to, through analysis of successful international experience, and based on current status of EES implementation and problems encountered, explore a way of establishing the EES implementation and supervision mechanism applicable for our national conditions, and then offer specific policy suggestions.

The project is planned to consist of three stages. Stage 1 is from May 2005 through April 2006, of which the main contents include the following:

Energy Foundation's China Sustainable Energy Program has provided Stage 1 of this project with most support, of which the contract number is G-0502-07753. EU-China Energy and Environment Programme has supported an important activity of Stage 1—the "International Workshop on EES Enforcement and Monitoring" held on November 7, 2005 in Beijing. The implementer of the contract is CNIS, and participants include China Household Electrical Appliances Association (CHEAA), Shanghai Energy Conservation Supervision Center, China National Standardization Technical Committee for Energy Basis and Management, Lawrence Berkeley National Laboratory (LBNL).

During the execution process, the project also received actual support and help from Director Yin Minghan, Industry and Traffic Department of Standardization Administration of China (SAC); Director Liu Chunyan, Product Quality Supervision Department of General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ); Vice-director-general Liu Fuzhong, CHEAA; Professor Li Hongqi, Beijing University of Technology; Mr. Wang Tong, Gree Electric Appliances, Inc. (Zhuhai); and Dr. Lin Jiang, an international expert of LBNL. Their helps are greatly appreciated.

Executive Report

(I) Project summary

Totally 44 countries in the world have effectively implemented EES, most of them have brought EES under energy codes, made up strict punishment measures for behaviors that fail to meet requirements of EES, and force enterprises to consciously follow EES by legislation. In addition, since consumers' senses of energy saving and environment protection have been widely increasing, all countries have fostered their practical socialized supervision system, which makes EES playing a significant role. In EU, besides mandatory EES, governments would also negotiate on energy efficiency targets with manufactures associations of household appliance and consumable electronic products etc., and reach voluntary agreements.

In general, a variety of developed countries emphasize full participation and wide coordination of all stakeholders for implementation of EES. The essential experience is that government selects reliable agencies to be responsible for publicity, promotion and pilot projects of policies relevant to EES, and to communicate with industry associations; and effective implementation of EES will be guaranteed by laws, measures of incentive policies, involvement of industry associations, enterprises' self-discipline, and supervision by consumers.

Energy efficiency standards promulgated in China are all mandatory national standards. Among them, the limited values of energy efficiency (mandatory energy efficiency performance Standards, MEPS) are core indices of EES, which are mandatory requirements, and the lowest threshold requirement for marketing of products; evaluating value of energy efficiency is an evaluating index to judge whether the product meets the requirements for energy saving products. Meantime, as per different energy consumption properties and market status, EES may also include both the energy efficiency grading criteria and the target limited values of energy efficiency.

China introduced voluntary energy conservation product certification system and mandatory energy labeling system respectively in 1998 and 2004. These two systems have great influences on strengthening EES implementation, leading and transforming market of energy consuming products. Generally speaking, However, China has not yet established a comprehensive framework of standards enforcement and monitoring, thus energy efficiency standards have yet to reach their intended impact.

During the new period of building a well-off society in an all-round way and seeking harmonious development of human and nature, to implement EES completely and effectively, improve efficiency of energy consuming products, save energy, reduce consumption, alleviate disparities between supply and demand, and protect environment, are realistically significant. On the Central Economic Working Conference held in December 2004, leaders of the Party and State all attached great importance to mandatory adoption of energy conservation standards so as to promote effect implementation of EES. The *Circular on Recent Major Tasks of Constructing Economical Society*

(NO. 21[2005] of the State Council) also emphasized that great effort should be made to promote energy conservation, adopt mandatory product energy label for air conditioners and refrigerators etc., enhance certification of energy saving products, establish elimination system for high energy consuming products, and prohibit production, import and sale of products that cannot meet minimum EES. Therefore, it is very necessary and urgent to conduct related research, establish a complete and effective EES implementation and supervision system, and explore measures and mechanisms for effective EES implementation and supervision.

With this background, EF China Sustainable Energy Program, with CNIS signed the contract of “Research on EES Implementation and Monitoring System” in April 2005. The contract term of the project is three years from May 2005 to April 2008. And EF has already provided research funds for the first year.

Goals of this project are: by 3 years’ research, to draw lessons from successful international experience on EES implementation and supervision, analyze current status, problems and demands of EES implementation and supervision, construct new framework for EES implementation and supervision in China, research and bring forward departmental regulations and plans for establishment of organizational framework which can drive the EES implementation and supervision, carry out pilot study on EES implementation, and finally establish a complete EES implementation and supervision system (including policy, institution, mechanism, resources etc.), so as to drive effective implementation of energy efficiency standards.

(II) Main activities and research achievements of the first year

Research activities during the year (May 2005 to April 2006) mainly include:

1. Research on international experience

Research was conducted on current status and development trend of EES implementation and supervision in typical countries and regions (such as Australia, USA, EU, Japan etc.), including laws and regulations, related policies, implementation mechanisms, supervision measures for implementation, and effects etc.

Sponsored by National Development and Reform Commission (NDRC), AQSIQ, SAC, and funded by EF China Sustainable Energy Program and EU-China Energy and Environment Programme, “International Workshop on EES Enforcement and Monitoring” was held in Beijing Landmark Towers on November 7, 2005, organized by CNIS and LBNL. Around 70 representatives, including experts from five countries together with domestic experts, representatives from government agencies, research institutions, industry associations, representative offices of international associations, enterprises, and media, attended the conference.

Through this successful workshop, we got better understanding of laws and policies of EES

implementation, implementation measurements and supervision mechanisms of various countries. A good number of foreign experts offered constructive suggestions for China's EES implementation and supervision, such as providing higher transparency during process of supervision, cooperating with international communities, harmonization to international standards, considerations during process of conformity, and establishment of social monitoring scheme. All of these will help us summarize successful experience and implementation effects of various countries, analyze current status of EES development in China and problems during implementation, so as to achieve the goal of driving establishment and perfection of framework on EES implementation and supervision.

2. Current status and problems of EES in China

Investigation and analysis of current status of EES implementation has been carried out, as well as of related systems and measures involved, diagnosed problems, and clarified demands of socioeconomic development for EES implementation in China. Main problems are:

- Laws and regulations system is not complete, and punishment degree is not stringent enough. Take energy labeling in China for instance, since it is still in early stage, strengthened supervision and guaranteed authenticity of labeling information are key factors for building up authority and ensuring smooth implementation of the system. At present, some enterprises attempt to make a convenience of "self declaration" to fish in troubled waters, marking false information on energy labels, which is seriously harming consumers' interests.
- Market supervision mechanism is not complete. Due to asymmetric energy efficiency information, obstructed complaint channels, weak ability to settle complaints, and especially consumers' inadequate knowledge of energy efficiency, effective social supervision mechanism has not been formed, and social foundation for supervision of EES implementation is insufficient.
- Incentive mechanism is insufficient. With no preferential policy, enterprises lack enthusiasm for manufacturing products having higher energy efficiency; and with no subsidy, consumers lack enthusiasm for buying energy efficient products.
- Publicity and education is not fully ready, and the public lack of related knowledge. Due to insufficient relevant funds and effective operation mechanism, EES-related social publicity, education, and training program for manufacturers, retailers and consumers are far to be satisfactory to social demands. Lack of training cause many stakeholders not able to aware of importance to EES, and market not able to recognize EES, which then affects EES effectiveness.

3. Research on framework of EES implementation and supervision system

Through researching and analyzing framework of technical standards system, operation mode of organizational management system, policies and measures that can promote implementation of

technical standards in China, combining current status and problems of EES implementation in China, studying EES implementation models of various countries, and comparing international experience, we brought forward the approaches for establishment and improvement of framework of EES implementation and supervision system. And based on this framework, we conducted research and brought forward policy suggestions which would promote effective EES implementation.

4. Preparation of Management Method of Energy Efficiency Standardization

As per relevant laws, regulations and management methods, including “*Standardization Law of the People's Republic of China*”, “*Regulations for the Implementation of the Standardization Law of the People's Republic of China*”, “*Management Method of National Standards*”, etc., in addition to the established framework of EES implementation, we conducted research and prepared the *Management method of energy efficiency standards* as supporting regulations for the “*Energy Conservation Law of the People's Republic of China*”, to define basic tasks and scope of energy efficiency standardization work, institution and duty, research contents and formulation procedures of EES, publicity and implementation training, framework and requirements of implementation, supervision and management, penalty provisions etc, as well as to bring forward plans for listing EES implementation and supervision into scope of national supervision and spot checking, and local supervision and spot checking, for product quality.

5. Research on establishment of social supervision mechanism and system for EES implementation

Implementation and supervision of EES is a systematic engineering, which requires cooperation of governments, enterprises and consumers so as to build up a complete operation system. Among them, social supervision mechanism is a key link. This project, through analyzing different models of various developed countries, investigated and analyzed related existing organizations in China, such as current status and operation modes of industry associations, consumers' associations, inspection institutions, and brought forward the plan of establishment of EES and label alliance joined by institutions and organizations including the industry and enterprises etc, so as to strengthen industry self discipline and social supervision.

The seminar of implementation anniversary of energy label, with the theme of “Energy Efficiency for Economical Society” was held in Beijing on March 1, 2006. Over 50 participants, including officials of NDRC, AQSIQ, SAC, as well as experts and representatives of associations, Beijing offices of international organizations, enterprises, retailers, inspection institutions, and media, attended the conference. On this conference, representatives of various institutions and organizations deeply discussed about China's supervision mode of energy label, and plans of energy label alliance, and agreed:

1) Current supervision level on energy labeling in China is not high enough, social supervision mechanism is urgently needed, and only combination of government efforts with social efforts can guarantee effective implementation of energy efficiency labeling system.

- 2) The concept of “Energy Labeling Alliance” is initiative and practical.
- 3) As for issues such as specific construction model, operation plan, inter-recognition of data among laboratories of enterprises, and funds etc. of the “Energy Label Alliance”, efforts should be made to organize authorities and related enterprises for further research; and for this alliance, an establishment and implementation plan which is practical and fits our current national status should be formulated as soon as possible.

6. Establishment of product EE information system

The goal of establishing a product energy efficiency information system is to generalize among the general public EE-related knowledge, issue EES, recommend list of products meeting EES, and provide a variety of services to consumers. During the first year, we mainly conducted survey and analysis of demands, built up the framework of the information system based on the existing energy efficacy label web (www.energylabel.gov.cn), defined major functions and contents of the information system, and designed a database of product information, etc.

(III) Policy suggestions

After comparison with implementation experience of other countries, and combining current conditions of China during the transition stage from planned economy to market economy, and current status and problems of EES implementation, we make suggestions that not only enforce supervision functions of the government, but also establish a social supervision mechanism. Specific suggestions are:

- Improve law system for formulation, implementation and supervision of EES, and formulate the Management Method of Energy Efficiency Standardization.
- Setup as soon as possible the elimination system for high energy consuming products
- Apply energy labeling to cover more products
- Strengthen certification of energy conservation products
- Provide favorable policies in terms of finance and taxation related, and promote high efficient products
- Improve national supervision and spot checking mechanism
- Establish social supervision mechanism
- Strengthen publicity and education

For example, the *Energy Conservation of Law* of China stipulates: The state applies an eliminating system for discontinuing backward, over energy-intensive energy-consuming products and

equipment. Mandatory certification system for limited values of energy efficiency can be established according to Canadian experience; and mandatory manufacturing license system may also be established as per national license system. In order to avoid duplication of labor, overlapping and duplication of agencies during products certification, and to reduce costs of manufacturers, we suggest, learning experience from the mature product certification and supervision systems (3C certification system and manufacturing license system), that the existing product index system adopt limited value of EE for related products. This not only has the advantages of reduced costs and simplified processes, but also would achieve the goal of eliminating high energy-consuming products from market by utilizing the mandatory features of existing systems.

For social supervision mechanism, the system of inspection by a third party should be adopted; the system of enterprises' self-discipline and mutual supervision should be fostered; enterprises alliance should be set up (to settle complaints of competitors, conduct verification tests, and issue products catalog etc.); the existing operation system of consumers' associations should be utilized to supervise energy-consuming products, for the purpose of protecting interests of consumers.

(IV) Working plan for the next two years

The tentative working plan for the next two years (May 2006—April 2008) is given below. Since research fund has not been ready, this working plan is still to be improved.

- During revision progress of the Energy Conservation Law, adopt the requirements of EES implementation and supervision into the law, to legalize implementation and supervision of EES;
- Revise and improve the Management Method of Energy Efficiency Standardization;
- Bring forward suggestions for adopting EES implementation and supervision into the scope of national and local supervision and spot checking;
- Discuss about establishment of a supervision committee joined by the industry, manufacturers and other related organizations, so as to strengthen enterprise self-discipline and social supervision;
- As for measures of implementation, research the relationship between EES and mandatory certification; discuss the applicability of adopting limited values of energy efficiency of EES into 3C certification system;
- Research and bring forward a plan of voluntary agreement on high efficiency index of EES;
- Improve the product EE information system;

- Choose some areas to conduct pilot projects on EES implementation and supervision, in order to bring forward a practical plan of implementation or implementation on target values of EES in shorter time in these local areas.

I. Preparation of Energy Efficiency Standards

(I) History of development

Research on EES in China started from mid-1980's, and experienced three development stages: starting stage in 1980s, steady development stage in 1990s, and fully upgrading stage in the new century. Under leadership of and support from national energy conservation management departments and standardization management sectors, and with support offered by international institutions such as EF and foreign experts, China up to now has enacted and implemented 25 energy efficiency standards (See Tab.1-1), covering 24 kinds of products in five categories, which include household appliances such as household refrigerators, room air conditioners and electrical washing machines etc., lighting products such as double-capped fluorescent lamps, self-ballasted fluorescent lamps and ballasts of fluorescent lamps etc., industrial equipment such as electric motors and air compressors etc., commercial equipment such as unitary air conditioners and water chilling packages etc., and vehicles such as passenger's cars.

Tab.1-1 EES Promulgated 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	Revision in progress

	asynchronous motors	
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	

At present, EES already prepared and to be approved are: EES for gas water heaters, power source adapters, and target EES for electric motors. EES under preparation are: EES for variable frequency air conditioners, and target EES for centrifugal pump for fresh water. EES under considerations are for: electric heaters, industrial boilers, power transformers, commercial freezers, microwave ovens, copy machines, set-top boxes, and multi-connected air-condition (heat-pump) unit.

(II) Contents of EES

EES means procedure or regulation that specifies energy performance of products. Normal EES fall into the three categories: directive standards, minimum energy performance standards (MEPS),

and class-average standards. Energy efficiency standards already published in China belong to MEPS, and are mandatory national standards with partial articles being mandatory.

Limited values of energy efficiency are core indices of EES, also mandatory requirements, being the lowest threshold requirement judging a product whether able to be marketed; evaluating values of energy conservation and energy efficiency grade are recommended indices, which provides technical references for energy conservation product certification system officially launched in China in 1998, and for energy efficiency information labeling system officially implemented in 2005. Meantime, according to energy consumption features and market conditions of various products, some EES also include indices such as target limited values of energy efficiency etc., namely, mandatory limited values of energy efficiency to be implemented 3-5 years after publication of EES. In addition, EES also specify classification of various productions, indices and parameters of energy efficiency (energy consumption), testing methods of energy efficiency indices, and product checking and inspection rules.

For the establishment of indices, relatively advanced international engineering/economic analytical methods are adopted, and such technical and economic analyses as “quantitative analysis of cost effectiveness of energy conservation techniques and approaches”, “analysis of influence on consumers”, “energy saving potential by standard implementation”, and “influence of standard on environment protection (emission reduction)”, are conducted, which provide scientific and reasonable theoretical references for the establishment of various EE indices.

(III) Introduction to EES

1. Household appliances

(1) Color TV set

GB12021.7-2005, *The Limited Value and Testing Method of Energy Efficiency for Broadcasting Receiver of Color Television*, stipulates the limited values of energy efficiency, evaluating values of energy conservation, and target limited values of energy efficiency of color TV respectively in on-mode and standby mode. Among them, the limited value of energy efficiency and evaluating values of energy conservation specify, for color TV sets, the market access indices and the energy conservation product certification indices in relation to energy efficiency, being a unified EE evaluating system; target limited values of energy efficiency, on the other hand, means the mandatory limited values of energy efficiency to be implemented 3-5 years after publication of EES, which is comparatively more stringent, so as to support the achievement of overall energy conservation strategy of China, set a definite energy conservation target for enterprises, and allow enough time for enterprises to conduct technical improvement.

(2) Household refrigerators

GB12021.2—2003, *The maximum allowable values of the energy consumption and energy efficiency grades for household refrigerators*, stipulates for household refrigerators (refrigerators for short), the maximum allowable values of energy consumption, energy efficiency grading criteria (Tab.1-2) and determination methods for evaluating values of energy conservation, testing methods and inspection rules of power consumption. This standard applies to electric motor compression refrigerators with volume being 500L or less.

Tab.1-2 Energy Efficiency Grades of Refrigerator

EE Indices	EE Grades
$\eta \leq 55\%$	1
$55\% < \eta \leq 65\%$	2
$65\% < \eta \leq 80\%$	3
$80\% < \eta \leq 90\%$	4
$90\% < \eta \leq 100\%$	5

Source: GB12021.2—2003 *the maximum allowable values of the energy consumption and grading criteria for household refrigerator*

(3) Room air conditioners

GB12021.3—2004, *The minimum allowable values of the energy efficiency and energy efficiency grades for room air conditioners*, for room air conditioners, limited values of energy efficiency, evaluating values of energy conservation, energy efficiency grading criteria (Tab.1-3), testing methods and inspection rules. This standard applies to air conditioners with air-cooled condenser, totally enclosed motor-compressor, refrigerating capacity being no more than 14000W, and climate type being T1.

Tab.1-3 Energy Efficiency Grades of Room Air conditioner

Type	Rated Cooling Capacity (CC) W	EE grades				
		5	4	3	2	1
Unitary type		2.30	2.50	2.70	2.90	3.10
Split type	$CC \leq 4500$	2.60	2.80	3.00	3.20	3.40
	$4500 < CC \leq 7100$	2.50	2.70	2.90	3.10	3.30
	$7100 < CC \leq 14000$	2.40	2.60	2.80	3.00	3.20

Source: GB12021.3—2004 *the limited values of energy efficiency and grading criteria for room air conditioners*

(4) Electric washing machines

GB 12021.4—2004, *The minimum allowable values of the energy efficiency and energy efficiency grades for household electric washing machines* stipulates, for electric washing machines, limited values of power consumption and unit power efficiency, limited values of water consumption, evaluating values of power conservation, and energy efficiency grading criteria (Tab.1-4). This standard applies to household electric washing machines with rated washing capacity no more than 13kg; does not apply to washing machines with rated washing capacity being 1.0kg or less, nor to single container washing machine with no dehydration function. For washing and drying machines, only the washing ability will be assessed.

Tab. 1-4 Energy Efficiency Grades of Electric Washing Machine

EE Grade of Washing Machine	Impeller-type Washing Machine			Drum-type washing machine		
	Power Consumption kWh/cycle / kg	Water Consumption L/cycle /kg	Cleaning Ratio	Power Consumption kWh/cycle / kg	Water Consumption L/cycle /kg	Cleaning Ratio
1	≤0.012	≤20	≥0.90	≤0.19	≤12	≥1.03
2	≤0.017	≤24	≥0.80	≤0.23	≤14	≥0.94
3	≤0.022	≤28		≤0.27	≤16	
4	≤0.027	≤32	≥0.70	≤0.31	≤18	≥0.70
5	≤0.032	≤36		≤0.35	≤20	

Source: GB 12021.4—2004 *Limited values of energy efficiency and grading criteria of household electric washing machines*.

2. Lighting products

(1) Ballasts for fluorescent lamps

GB17896-1999, *Limited values of energy efficiency and evaluating values of energy conservation of ballasts for tubular fluorescent lamps* applies to independent inductance ballasts and electronic ballasts for tubular fluorescent lamps of 220V, 50Hz AC type with nominal power being 18W~40W, and does not apply to electronic ballasts of non-preheating startup type. The limited values of energy efficiency and evaluating values of energy conservation are given below in Tab.1-5 and Tab.1-6.

Tab. 1-5 Limited Values of Energy Efficiency of Ballasts for Tubular Fluorescent Lamps

Nominal Power, W	18	20	22	30	32	36	40
Inductance type	3.154	2.952	2.770	2.232	2.146	2.030	1.992

BEF	Electronic type	4.778	4.370	3.998	2.870	2.678	2.402	2.270
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Tab.1-6 Evaluating Values of Energy Conservation of Ballasts for Tubular Fluorescent Lamps

Nominal Power, W		18	20	22	30	32	36	40
BEF	Inductance type	3.686	3.458	3.248	2.583	2.461	2.271	2.152
	Electronic type	5.518	5.049	4.619	3.281	3.043	2.681	2.473

Source: GB17896-1999 *Limited values of energy efficiency and evaluating values of energy conservation of ballasts for tubular fluorescent lamps*

(2) Double-capped fluorescent lamps

GB19043-2003, *Limited values of energy efficiency and grading criteria of double-capped fluorescent lamps for general lighting service* applies to bombarding cathode double-capped fluorescent lamps with AC power supply frequency and starter, and bombarding cathode double-capped fluorescent lamps utilizing high frequency, with the range of nominal power being 14W~65W. For requirements of energy efficiency grades please see Tab.1-7.

Tab. 1-7 Energy Efficiency Grades of Double-Capped Fluorescent Lamps

Nominal Power Range W	Initial Luminous Efficacy lm/W								
	EE Grade (Hue: RR, RZ)			EE Grade (Hue: RL, RB)			EE Grade (Hue: RN, RD)		
	1	2	3	1	2	3	1	2	3
14-21	75	53	44	81	62	51	81	64	53
22-35	84	57	53	88	68	62	88	70	64
36-65	75	67	55	82	74	60	85	77	63

Note: RR, RZ, RL, RB, RN, RD are color parameters of lamps

Source: GB19043-2003 *Limited values of energy efficiency and grading criteria of double-capped fluorescent lamps for general lighting service*

Limited values of energy efficiency of double-capped fluorescent lamps are EE Grade 3 in Tab.1-7; evaluating values of energy conservation of high luminous efficacy series (14W, 21W, 28W, 35W) are EE Grade 1 in Tab.1-7; and evaluating values of energy conservation of other double-capped fluorescent lamps are EE Grade 2 in Tab.1-7.

Target limited values of energy efficiency of double-capped fluorescent lamps, implemented on August 1, 2005, are shown in Tab.1-8.

Tab.1-8 Target Limited Values of EE of Double-Capped Florescent Lamps in 2005

Nominal Power Range W	Initial Luminous Efficacy lm/W		
	Hue: RR, RZ	Hue: RL, RB	Hue: RN, RD
14-21	53	62	64
22-35	57	68	70
36-65	67	74	77

Note: RR, RZ, RL, RB, RN, RD are color parameters of lamps

Source: GB19043-2003 *Limited values of energy efficiency and grading criteria of double-capped fluorescent lamps for general lighting service*

(3) Self-ballasted fluorescent lamps

GB19044-2003, *Limited values of energy efficiency and grading criteria of self-ballasted fluorescent lamps for general lighting service*, applies to self-ballasted fluorescent lamps, with the rated voltage being 220V, power supply being 50Hz AC, nominal power being 60W or less, which use screw type or bayonet type lamp holder for general lighting services in home or similar situations, and integrate startup and steady ignition control parts. This standard does not apply to self-ballasted florescent lamps with covers. For energy efficiency grades please see Tab. 1-9.

Tab. 1-9 Energy Efficiency Grades of Self-Ballasted Fluorescent Lamps

Nominal Power Range W	Initial Luminous Efficacy lm/W					
	EE Grade (Hue: RR, RZ)			EE Grade (Hue: RL, RB, RN, RD) ^{a)}		
	1	2	3	1	2	3
5-8	54	46	36	58	50	40
9-14	62	54	44	66	58	48
15-24	69	61	51	73	65	55
25-60	75	67	57	78	70	60

Note: RR, RZ, RL, RB, RN, RD are color parameters of lamps

Source: GB19044-2003 *Limited values of energy efficiency and grading criteria of self-ballasted fluorescent lamps for general lighting service*

Limited values of energy efficiency for self-ballasted fluorescent lamps are EE Grade 3 in Tab.1-9; and evaluating values of energy efficiency are Grade 2 in Tab.1-9.

(4) Single-capped fluorescent lamps

GB19415-2003, *limited values of energy efficiency and evaluating values of energy conservation for single-capped fluorescent lamps*, applies to single-capped fluorescent lamps with bombarding cathode and internal or external starting device. The limited values of energy efficiency are given in Tab.1-10, and evaluating values of energy conservation in Tab.1-11.

Tab.1-10 Limited Values Energy Efficiency of Single-Capped Fluorescent Lamps

Types of Lamps	Nominal Power W	Minimum Initial Luminous Efficacy, lm/W	
		RR, RZ ^{a)}	RL, RB, RN, RD ^{a)}
Doulbe-tube, quadruple-tube, multi-tube, and square types	5-7	41	44
	9, 10, 13	50	54
	11(double-tube)	67	72
	16-26	56	60
Double-tube and square types	≥28	62	66
Multi-tube type		54	58
Ring type	22	44	51
	≥32	48	57

Tab.1-11 Evaluating Values of Energy Conservation of Single-Capped Fluorescent Lamps

Types of Lamps	Nominal Power W	Minimum Initial Luminous Efficacy, lm/W	
		RR, RZ ^{a)}	RL, RB, RN, RD ^{a)}
Doulbe-tube, quadruple-tube, multi-tube, and square types	5-7	51	54
	9, 10, 13	60	64
	11(double-tube)	74	80
	16-26	62	66
Double-tube and square types	≥28	69	73
Multi-tube type		64	68
Ring type	22	58	62
	≥32	68	72

Source: GB19415-2003 *Limited values of energy efficiency and evaluating values of energy conservation for single-capped fluorescent lamps.*

(5) High-pressure sodium vapor lamps

GB19573-2004, *limited values of energy efficiency and grading criteria for high-pressure sodium vapor lamps*, applies to high-pressure sodium vapor lamps used for indoor lighting, with transparent glass bulb, the power ranging 50W~1000W, and with suitable ballast and ignitor, which can normally start and ignite in the range of 92%-106% of rated voltage. Energy efficiency grades are shown in Tab. 1-12; the limited values of energy efficiency are EE Grade 3 in Tab.1-12, and the evaluating values of energy conservation are EE Grade 2 in Tab.1-12.

Tab. 1-12 Energy Efficiency Grades of High-Pressure Sodium Vapor Lamps

Rated Power W	Mimimum Average Initial Luminous Efficacy lm/W		
	Energy Efficiency Grade		
	Grade 1	Grade 2	Grade 3

50	78	68	61
70	85	77	70
100	93	83	75
150	103	93	85
250	110	100	90
400	120	110	100
1000	130	120	108

Source: GB19573-2004 *Limited values of energy efficiency and grading criteria for high-pressure sodium vapor lamps.*

(6) Ballasts for high pressure sodium lamps

GB19574-2004, *limited values of energy efficiency and evaluating values of energy conservation of ballasts for high pressure sodium lamps*, applies to independent or built-in inductance ballasts for high-pressure sodium lamps with the rated voltage being 220V, power supply being AC 50Hz, and the rated power being 70W~1000W. The limited values of energy efficiency, the target limited values of energy efficiency, and the evaluating values of energy conservation are shown in Tab.1-13.

Tab.1-13 Limited Values of Energy Efficiency and Evaluating Values of Energy Conservation of Ballasts for High-Pressure Sodium Lamps

Rated Power, W		70	100	150	250	400	1000
BEF W ⁻¹	Limited Values of EE	1.16	0.83	0.57	0.340	0.214	0.089
	Target Limited Values of EE	1.21	0.87	0.59	0.354	0.223	0.092
	Evaluating Values of Energy Conservation	1.26	0.91	0.61	0.367	0.231	0.095

Source: GB19574-2004 *limited values of energy efficiency and evaluating values of energy conservation of ballasts for high pressure sodium lamps.*

(7) Metal halide lamps

GB20054-2006, *Limited values of energy efficiency and grading criteria for metal halide lamps*, applies to Sc-Na single-capped metal halide lamps with the power of 175W~1500W and transparent glass bulb. EE grades are shown in Tab.1-14; the limited values of energy efficiency are EE Grade 3 in Tab.1-14, and the evaluating values of energy conservation are EE Grade 2 in Tab.1-14.

Tab. 1-14 Energy Efficiency Grades of Metal Halide Lamps

Rated Power	Mimumum Initial Luminous Efficacy lm/W
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W	Energy Efficiency Grade		
	1	2	3
175	86	78	60
250	88	80	66
400	99	90	72
1000	120	110	88
1500	110	103	83

Source: GB20054-2006 *limited values of energy efficiency and grading criteria for metal halide lamp.*

(8) Ballasts for Metal Halide Lamps

GB20053-2006, *limited values of energy efficiency and evaluating values of energy conservation of ballasts for metal halide lamps*, applies to independent or built-in LC crest target inductance ballasts used for single-capped metal halide lamps with the rated voltage being, the power supply being AC 50Hz, and the nominal power being 175W-1500W. The energy efficiency grades are shown in Tab.1-15; the limited values of energy efficiency are EE Grade 3 in Tab.1-15, and the evaluating values of energy conservation are EE Grade 2 in Tab.1-15.

Tab.1-15 Energy Efficiency Grades of Ballasts for Metal Halide Lamps

Rated Power, W		175	250	400	1000	1500
<i>BEF</i> W^{-1}	Grade 1	0.514	0.362	0.233	0.0958	0.0638
	Grade 2	0.488	0.344	0.220	0.0910	0.0606
	Grade 3	0.463	0.326	0.209	0.0862	0.0574

Source: GB20053-2006 *limited values of energy efficiency and evaluating values of energy conservation of ballasts for metal halide lamps.*

3. Industry equipment

(1) Fans

Limited values of energy efficiency and evaluating values of energy conservation for fans, of which the Code is GB19761-2005, was effective on December 1, 2005. This standard applies to centrifugal ventilators, aerofoil fans and air-conditioner centrifugal ventilators for general purposes, and stipulates respectively the limited values of energy efficiency and evaluating values of energy conservation of ventilators. For ventilators employing general electric motors, the limited values of energy efficiency and evaluating values of energy conservation are stipulated as per the maximum efficiency of ventilator in application area. For air-conditioner centrifugal ventilators employing outer rotor motor (except single-phase and three-phase multi-speed types), the limited values of energy efficiency and evaluating values of energy conservation are respectively stipulated as per the maximum total efficiency of ventilator in application area.

(2) Centrifugal pumps for fresh water

The *limited values of energy efficiency and evaluating values of energy conservation of centrifugal pumps for fresh water* (GB19762-2005) was issued on December 1, 2005. This standard applies to single-stage centrifugal pumps for fresh water (single-suction and double-suction), multi-stage centrifugal pumps for fresh water, borehole shaft driven centrifugal pumps, and centrifugal pumps with the medium being similar with fresh water. This standard respectively stipulates the limited values of energy efficiency and evaluating values of energy of centrifugal pumps for fresh water. The limited values of energy efficiency are, under test conditions stipulated in the standard, the lowest allowable guaranteed values of efficiency of pumps at specified point. The evaluating values of energy conservation are, under test conditions stipulated in the standard, the lowest guaranteed values that the efficiency of energy saving pumps at specified point should meet.

(3) Small and medium three-phase asynchronous motors

GB18613-2002, *limited values of energy efficiency and evaluating values of energy conservation of small and medium three-phase asynchronous motors*, applies to single-speed enclosed fan-cooled and N designed motors and explosion-proof motors for general services, with the power supply being 660V or lower, 50Hz three-phase AC, the scope of rated power being 0.55kW-315kW, and the number of poles being 2, 4 or 6. This standard stipulates, for small and medium three-phase asynchronous motors, grades of energy efficiency, limited values of energy efficiency, target limited values of energy efficiency, and evaluating values of energy conservation. The energy efficiency of electric motors has three grades, with the Grade 1 having the highest energy efficiency. The limited values of energy efficiency mean that both the efficiency (%) of electric motors at the rated output power, and the efficiency at 75% of the rated output power, should not be lower than Grade 3. The target limited values of energy efficiency mean that the efficiency should not be lower than Grade 2, which are to be implemented 4 years after the implementation of this standard. The Evaluating values of energy conservation mean that the efficiency (%) should not be lower than Grade 2.

(4) Distribution transformers

GB20052-2006, *limited values of energy efficiency and evaluating values of energy conservation for distribution transformers*, applies to 3-phase 10kV, non-excitation regulated oil-immersed transformers with the rated capacity being 30kVA-1600kVA, and dry type transformers with the rated capacity being 30kVA~2500kVA. The limited values of energy efficiency are, under stipulated test conditions, the standard values (W) of no-load loss and load loss of distribution transformers. The evaluating values of energy conservation are, under stipulated test conditions, standard values (W) to evaluate no-load loss and load loss of distribution transformers.

(5) Displacement air compressors

GB19153-2003, *Limited values of energy efficiency and evaluating values of energy conservation for displacement air compressors*, applies to direct-drive portable reciprocating piston air compressors, oil-jet screw air compressors for general use, and oil-jet sliding vane air compressors for general use. This standard stipulates the limited values of energy efficiency and evaluating

values of energy conservation of air compressors.

4. Commercial equipment

(1) Water chilling packages

GB19577-2004, *limited values of energy efficiency and energy efficiency grades for water chilling packages*, issued on March 1, 2005, applies to water chilling (heat pump) units using the vapor compression cycle with motor driven compressors. This standard stipulates the limited values of energy efficiency, energy efficiency grades, and evaluating values of energy conservation of water chilling packages. The limited values of energy efficiency are the minimum values of energy efficiency ratio (EER) (Tab.1-16) of water chilling packages, under the rated chilling conditions and stipulated conditions. The energy efficiency of water chilling packages has five grades, with the Grade 1 having the highest energy efficiency (Tab.1-17). The evaluating values of energy conservation of water chilling packages are EE Grade 2 in Tab.1-17.

Tab.1-16 Limited Values of Energy Efficiency of Water chilling packages

Type	Rated Chilling Capacity (CC) KW	Coefficient of Performance W/W
Water-cooled water chilling packages	CC≤528	3.8
	528<CC≤1163	4.0
	1163<CC	4.2

Tab. 1-17 Energy Efficiency Grade Indices of Water Chilling Packages

Type	Rated Chilling Capacity (CC) KW	Coefficient of Performance (COP) /(W/W)				
		1	2	3	4	5
Water-cooled water chilling packages	CC≤528	5.0	4.7	4.4	4.1	3.8
	528<CC≤1163	5.5	5.1	4.7	4.3	4.0
	1163<CC	6.1	5.6	5.1	4.6	4.2

Source: GB19577-2004 *limited values of energy efficiency and energy efficiency grades for water chilling packages*

(2) Unitary air conditioners

GB 19576-2004, *Limited values of energy efficiency and grading criteria of unitary air conditioners*, officially implemented on March 1, 2005, applies to unitary air conditioners, air-blast duct air conditioners and rooftop air conditioners which have nominal chilling capacity of more than 7100W and motor-driven compressors. This standard does not include multi-connected air conditioning (heat pump) units or variable frequency air conditioners. This standard stipulates the limited values of energy efficiency, the evaluating values of energy conservation, and the energy efficiency grades, of unitary air conditioners.

5. Automobiles

GB19578-2004 *Limits of fuel consumption for passenger cars*, the first mandatory national standard of oil consumption of vehicles in China, was promulgated on October 29, 2004. This national standard uses the complete vehicle mass to determine the oil consumption of automobile, instead of using grade of engine displacement. This standard will be implemented by two stages. For newly developed automobiles, the implementation date of Stage 1 is July 1, 2006, while the implementation date of Stage 2 is January 1, 2009. Experts of this industry agree that Stage 1 of the limited values is the first step of economical efficiency standard of automobile fuel. Most small type cars can meet requirements of Stage 1 with no or little modification, which allows manufacturers sufficient time to conduct modification of automobile technologies for Stage 2. The Stage 2 of limited values is the one that is actually incentive for technical modification. Fuel consumption standards of various complete vehicle mass are shown in Tab.1-18.

Tab.1-18 Limits of fuel consumption for passenger cars

Complete Mass (CM)	Stage 1	Stage 2	Stage 1*	Stage 2*
CM≤750	7.2	6.2	7.6	6.6
750<CM≤865	7.2	6.5	7.6	6.9
865<CM≤980	7.7	7.0	8.2	7.4
980<CM≤1090	8.3	7.5	8.8	8.0
1090<CM≤1205	8.9	8.1	9.4	8.6
1205<CM≤1320	9.5	8.6	10.1	9.1
1320<CM≤1430	10.1	9.2	10.7	9.8
1430<CM≤1540	10.7	9.7	11.3	10.3
1540<CM≤1660	11.3	10.2	12.0	10.8
1660<CM≤1770	11.9	10.7	12.6	11.3
1770<CM≤1880	12.4	11.1	13.1	11.8
1880<CM≤2000	12.8	11.5	13.6	12.2
2000<CM≤2110	13.2	11.9	14.0	12.6
2110<CM≤2280	13.7	12.3	14.5	13.0
2280<CM≤2510	14.6	13.1	15.5	13.9
2510<CM	15.5	13.9	16.4	14.7

Note 1: * means automobiles having one or more such characters: a) equipped with automatic transmission; b) having three or more rows of seats; c) M1G type automobiles in accordance with Article 3.5.1 of GB/T15089-2001. M1 means passenger cars having no more than 9 seats including driver's seat. M1G means M1 type SUVs having no more than 9 seats including driver's seat.

Note 2: the unit of "complete mass"(CM) of this table is kilogram (kg); the unit of "stage 1" and "stage 2" is liter/100 kilometers (L/100km), namely, fuel consumption of every 100 kilometers.

Source: GB19578-2004 *limits of fuel consumption for passenger cars*.

II. Current Implementation Status of EES in China

(I) Laws, regulations and policies of EES implementation

At present, China has basically established a framework of standardization laws system, including “*Standardization Law of the People's Republic of China*” (“*Standardization Law*” for short), “*Regulations for the Implementation of the Standardization Law of the People's Republic of China*”(“*Regulations for the Implementation*” for short), and supporting “*Management Method of National Standards*”, “*Management Method of Industry Standards*”, “*Management Method of Local Standards*”, “*Management Method of Enterprise Standards*”, “*Management Method of Agriculture Standardization*”, “*Management Method of Energy Standardization*”, and “*Management Method of Adoption of International Standards and Advanced Foreign Standards*”, etc.

Other laws, regulations and policies in relation to EES implementation are: “*Energy Conservation Law of the People's Republic of China*” (“*Energy Conservation Law*” for short), “*Management Method of Energy Conservation Products Certification*”, “*Management Method of National Supervision and Spot Checking of Products Quality*”, “*Medium and Long-Term Energy Conservation Plan*” and “*Management Method of Energy Efficiency Label*” etc.

1. “*Standardization Law*” and the “*Regulations for the Implementation*”

“*Standardization Law*” was effective on April 1, 1989, of the revision in progress. “*Standardization Law*” stipulates development, implementation, supervision and related laws of standards.

In addition, the State Council also promulgated the “*Regulations for the Implementation of the Standardization Law of the People's Republic of China*”. Of which, article 33 is a specific stipulation of punishment on products not meeting mandatory standards of production, sales and imports: “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 Yuan or less 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.”

Article 33 also stipulates: “The order to stop production and the administrative sanctions provided for in this Article shall be decided by the relevant administrative authorities. Other administrative sanctions shall be decided by the administrative departments for standardization and the administrative departments in charge of industry and commerce within their competence.”

For behaviors violating laws, Article 34 stipulates: “Where units cause serious consequences and commit crimes by producing, marketing and importing products which fall short of the compulsory standards, the persons directly responsible shall be investigated for criminal liabilities by the judicial organs according to law.”

2. Regulations of standardization and quality inspection

As per the “*Standardization Law*”, the former National Bureau of Technical Supervision (the present General Administration of Quality Supervision, Inspection and Quarantine, AQSIQ for short), formulated the “*Management Method of Energy Standardization*”. The Article 8 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 *Regulations for the Implementation of the Standardization Law of the People's Republic of China*.” For supervision 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 competent inspection agencies of other units, which are set 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.”

“*Management Method of National Supervision and Random Inspection of Products Quality*” comes into effect on March 1, 2002. The national supervision and random inspection is one of the main methods of conducting supervision and inspection of product quality by the State, which means that Product Quality Supervision Department of the State Council organizes according to law relevant provincial quality and technical supervision departments and product quality inspection agencies to carry out sampling and inspection of products produced and marketed, and announces according to law the results of random inspection and treatment adopted. This method stipulates that, products supervised and randomly inspected by the State mainly include products

concerning human health, personal and property safety, industry products essential to the national economy and the people's livelihood, and products having quality defects according to users, consumers and related organizations. AQSIQ shall be responsible for developing the “*List of Major Products Subjected to National Supervision and Random Inspection*”; and shall conduct revision and modification according to status of product development and change in quality change. This method points out that national supervision and random inspection has two types, namely, regular and irregular national supervision and random inspection. Regular national supervision and random inspection shall be conducted every quarter, and national supervision and special random inspection shall be conducted irregularly according to status of product quality.

3. Energy Conservation Law

Energy Conservation Law came into force on Jan 1, 1998, which regulates energy conservation management, reasonable utilization of energy, improvement of energy conservation technologies, and legal liabilities. For the elimination system of outmoded high intensity energy consuming products and equipment, article 17 stipulates: “The catalogue of high intensity energy consuming products and equipment to be phased out shall be determined and published by the department of energy conservation administration under the State Council in conjunction with the departments concerned under the State Council. Specific measures for implementation shall be developed by the department of energy conservation administration under the State Council in conjunction with the departments concerned under the State Council.”

For energy conservation products certification system, article 18 stipulates: 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.”

For energy efficiency labeling system, Article 26 stipulates: “Units and individuals making energy-consuming products shall truthfully annotate the energy consumption index on product descriptions and product marks.”

4. Supporting laws and regulations of the “*Energy Conservation Law*”

The “*Management Method of Energy Conservation Products Certification*” published in 2002 explicitly specifies that, certification of energy conservation products is to, through confirmation and issue of a energy conservation product certificate and energy conservation mark by an energy conservation product certification agency, certify a product is energy conservation product. The certification of energy conservation product adopts the principal of voluntarism. This method

stipulates certification conditions, certification procedures, certificates, usage of energy conservation marks, and supervision, inspection, penalty, appeal, and treatment after certifying. The *“Management Method of Energy Efficiency Label”* was co-published by NDRC and the AQSIQ on August 13, 2004. Article 3 in Chapter 1 stipulates: “The state adopts unified energy efficiency labeling system for energy consuming products with huge energy conservation potential and wide usage. The state prepares and publishes the *“Product List for the Implementation of Energy Labeling system, the People’s Republic of China”* (“The Product List” for short), and defines unitary and applicable product energy efficiency standards, implementation rules, and pattern and specification of the energy efficiency label.” Article 6 stipulates: “National Development and Reform Commission (NDRC), National Administration of Quality Supervision, Inspection and Quarantine (AQSIQ), and Certification and Accreditation Administration of the People’s Republic of China (CNCA) shall be responsible for establishment and implementation of energy efficiency labeling system. The energy conservation management departments of local governments, local quality supervision departments, and the inspection and quarantine organizations for import and export at different levels shall implement and supervise the implementation of energy label within the scope of their responsibilities.” This management method also includes provisions for implementation, supervision management of energy efficiency labels, and penalty rules.

5. Medium and Long-Term Energy Conservation Plan

The *“Medium and Long-Term Energy Conservation Plan”*, published on November 25, 2004, puts forward, according to current energy conservation potential and features of future energy demands in our country, that the key energy conservation sectors during the “Eleventh Five Year Plan” period are industry, traffic and transportation, commercial and civil applications. Among them, the key points of energy conservation in industry are high energy consuming industries such as electric power, steel, non-ferrous metal, petroleum and petrochemical, chemical, building materials, coal and mechanics etc; the key points of energy conservation in traffic and communication are new automobiles; the key point of energy conservation in building is strict implementation of energy saving design standards; and the key point of energy conservation in commercial and civil application is the improvement of EES of energy consuming equipment. The Plan also brings forward the organization and implementation of ten key energy conservation projects during the “Eleventh Five Year Plan” period, including modification of industrial coal-burning boilers (furnace), regional combined heat and power generation, utilization of excessive heat and pressure, saving and replacing oil, energy conservation of electric motor system, energy system optimization, energy conservation of buildings, the green lighting project, energy conservation of governmental departments, and establishment of energy conservation monitoring and technical service system. In addition, The Plan prepares ten guaranteeing measures, of which the fifth measure is to strengthen the implement of energy conservation management

according to law. The Plan points out: “accelerate the establishment and perfection of energy conservation law and regulation system of which the core is the Energy Conservation Law, and supporting laws, regulations and standards are coordinated; and intensify supervision and management. Research and perfect laws concerning energy conservation, and formulate supporting laws and regulations as soon as possible. Formulate and implement mandatory and target EES. Organize revision and perfection of criteria and standards of energy conservation design and building of main energy consuming industries. Formulate economical fuel efficiency standards of motor vehicles, and establish and implement three systems of submission, label and announcement of economical fuel efficiency of motor vehicles. Establish and perfect supervision system of energy conservation, and strengthen supervision and law enforcement.”

(II) Management system of EES implementation

According to provisions of the “*Standardization Law*”, the standardization work in China currently adopts the management system of “unified leadership, respective responsibilities”, namely government exercises direct leadership over the standardization work. The “unified leadership” means the competent department in charge of standardization (the former National Bureau of Technical Supervision, now AQSIQ) under the State Council exercises unified leadership over the standardization work throughout the country (including guideline, policy, program, plan, project, examination and approval, numbering, promulgation and standard filing); the “respective responsibilities” means departments and local areas shall be responsible for the standardization work in their departments and local areas respectively, namely, the relevant administrative departments under the State Council shall be responsible for the supervision the standardization work in their respective departments and trades; the relevant administrative authorities in directly under local governments be responsible for the supervision over the standardization work in the respective administrative areas.

For example, the Environment and Resources Department of NDRC shall be responsible for instructing the drafting of product EES, instructing the establishment of certification system and energy efficiency labeling system for energy saving products.

The implementation of EES is mainly undertaken by the Quality Supervision Department and the Law Enforcement Department of AQSIQ, the Standardization Administration of China (SAC for short), CNCA, NDRC, State Administration for Industry and Commerce (SAIC), and relevant local agencies (see Fig.2-1). Introductions to implementation and management departments of standards are given below:

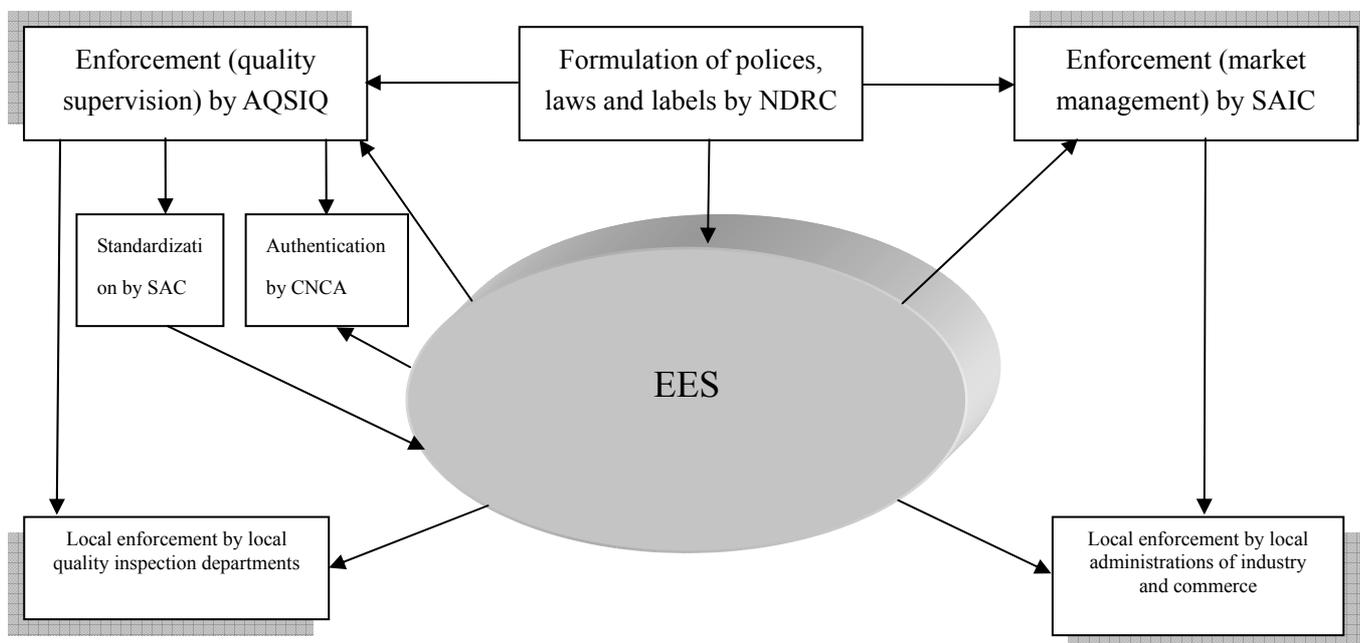


Fig.2-1 Sketch Map of EES Implementation and Management System

1. National Development and Reform Commission

NDRC is a macroeconomic management agency under the State Council, which studies and develops policies for economic and social development, maintains a balance of economic aggregates and guides the overall economic system restructuring. At present, The NDRC has 26 functional departments/bureaus/offices. Among them, the Bureau of Energy is responsible for studying energy development and utilization both at home and abroad, and putting forward energy development strategies and major policies; formulating development plans of the energy sector, and making recommendations on system reform in the energy sector; administering oil, natural gas, coal, power and other parts of the energy sector and national oil reserve; and formulating policy measures for energy conservation and renewable energy development. The Department of Environment and Resource Conservation is responsible for studying and resolving major problems concerning the coordinated development of economy, society, environment and resource; putting forward related laws and regulations; organizing formulation of programs, such as the “*Medium and Long-Term Energy Conservation Plan*”; instructing to draft product EES; instructing to

establish product certification system and energy efficiency labeling system; putting forward examination and approval opinion for major energy conservation projects; and exploring and establishing market-oriented new mechanisms of energy conservation.

2. AQSIQ and local departments

AQSIQ is an agency directly under the State Council, which is in charge of quality, measurement, inspection of entry and leaving the country commodity, health quarantine, quarantine of entry and leaving the country animals and plants, certification and accreditation, and standardization throughout the country, and exercises administrative and enforcement functions. At present, the AQSIQ has 18 functional departments/bureaus/offices. Among them:

(1) Standardization Administration of China (SAC)

This is an administrative agency authorized by the State Council, which exercises administrative functions, being responsible for unified administration, supervision, comprehensive coordination of standardization work through out the country. Its main duties are: participating development and revision of national standardization laws and regulations; preparation of development plan of national standardization cause; organizing formulation and revision of national standards, and being in charge of unified examination, approval, numbering and publication of national standards; administrating funds for development and revision of national standards, and special appropriation for study of standards and standardization; administrating and instructing standardization scientific work and related publicity, education and training programs; coordinating and administrating works of standardization committees through out the country; coordinating and instructing standardization work in trades and local areas; filing and recording trade standards and local standards; participating on behalf the nation in the International Standard Organization (ISO), International Electrotechnical Commission (IEC) and other international or regional standardization organizations; administrating organization code through out the country and commodity bar code; in charge of publicity, implementation and promotion work of national standards; supervising implementation status of national standards; carrying out, under unified arrangement and coordination of AQSIQ, notification and consultation work of related standards during implementation of agreement of Technical Barrier to Trade of World Trade Organization (WTO/TBT agreement).

(2) Certification and Accreditation Administration of the People's Republic of China (CNCA)

This competent agency was established and authorized by the State Council, to strengthen unified leadership and supervision and administration of certification and accreditation work, which exercises administrative functions. Its main duties are: studying to formulate laws, regulations and rules concerning national certification and accreditation, approval assessment, safety and quality license, and sanitary registration; promulgating and organizing implementation of systems and

regulations in relation to supervision and administration; studying to put forward and organizing implementation of guidelines, systems and working rules of national certification and accreditation and approval assessment works, as well as coordinating and instructing certification and accreditation work through out the country; formulating product list for implementation of national compulsory certification and safety and quality accreditation systems; formulating and promulgating certification marks (labels), approval assessment procedures and technical rules; supervising and regulating certification market according to law; supervising and administrating behaviors and activities of such intermediary services as voluntary certification and certification consultation etc.; conducting qualification examination and supervision over various such institutions providing services in relation to certification and accreditation as joint ventures, cooperative institutions and foreign-funded institutions; administrating assessment and qualification accreditation of technical abilities of laboratories in relation to adjustment, detection and inspection, being responsible for qualification examination of technical abilities of laboratories of joint ventures, cooperative institutions and foreign-funded institutions engaged in adjustment, detection, verification, inspection, check, quarantine and identification; administrating and coordinating certification and accreditation, and assessing to approve international cooperative activities, by separate departments; establishing inter-department joint meeting system for national certification and accreditation work, comprehensively coordinating certification and accreditation work through out the country.

(3) Law Enforcement and Supervision Department (Office of Cracking down on Fake Products, AQSIQ)

This department is responsible for organizing, coordinating to investigate and prosecute behaviors violating laws and regulations of standardization, measurement and quality. Authorized by the State Council, it is responsible for organizing and coordinating activities of cracking down on fake products through out the country; organizing this section to strike illegal acts of fake products; organizing and coordinating supervision for investigating and prosecuting accordingly cross-province (autonomous regions, municipality directly under the Central Government) cases and major and important cases; administrating and instructing administrative agencies of quality and technical supervision, and establishment of administrative teams; undertaking administrative review procedures and administrative litigation work, and instructing, supervising and inspecting administration and law enforcement work.

(4) Product Quality Supervision Department

This department is responsible for organizing and enforcing supervision and spot checking of product quality through out the country; developing list of key domestic products subjected to national supervision, and organizing to conduct supervision; organizing to conduct product quality monitoring and mandatory inspection to manufacturing enterprises; administrating and coordinating trade supervision, local supervision and specialty quality supervision of product quality; administrating inspection and assessment of quality arbitration; supervising and

administrating quality inspection institutions at national level; administrating manufacturing license work for industrial products.

3. State Administration for Industry and Commerce (SAIC) and local bureaus

SAIC is the competent authority directly under the State Council in charge of market supervision/regulation and related law enforcement through administrative means. At present, it has 16 functional departments/bureaus/offices. Among them:

(1) Consumer Protection Bureau

The Bureau drafts and enforces regulations on consumer protection and the implementation rules thereof. It launches investigation to penalize serious infringements on consumers' legitimate rights and interests, oversees the quality of marketed goods, investigates and penalizes the selling of fake and/or substandard goods and other irregularities.

(2) Department of Market Regulation

The Department drafts and enforces regulations on supervising market order and the implementation rules thereof. It regulates market order and contract performance in accordance with law and initiates investigation to penalize contract frauds and other illegal acts. The Department also administers the registration of chattel mortgages, regulates auctions and launches special campaigns for control of acute problems in marketplaces.

(III) Implementation measures

To summarize, EES implementation and supervision measures in China can be divided into three categories:

The first one is implementation and supervision promoted by governments: mainly including such mandatory systems as supervision and spot checking, mandatory certification, mandatory labeling, standards registration, supervision system (engineering supervision, equipment supervision), guarantee of repair, replacement and refund of substandard products, manufacturing license, recall system of defective products, government procurement; incentive policy measures, for example, national quality supervision department may prepare certificates for product exemption from quality surveillance inspection, top brand product, quality management award, excellent enterprises for quality management, product quality credit assessment, and establishment of product quality reputation system, etc.

The second one is enterprises' voluntary implementation and supervision: enterprises setup advanced quality management system; develop advanced product standards; establish complete product out-quality-control system; actively apply for voluntary system certification and product certification, self-declaration of product's compliance, and contract; setup special sectors for receiving and treating quality complaints, quality commitment, and voluntary agreement, etc.

The third one is implementation by such subjects as intermediary institutions and social supervision, which includes: publicity and supervision by news media, trade organizations and social groups; consumer complaints and solutions; preparation of such relevant activities as “Standardization Day”, “Quality Month”, “Quality Campaign”, and “3·15 Day for Protecting Consumers’ Rights” to generalize standards, quality and performance inspection, and arbitration.

According to technical features of EES in China (See Section 2 Chapter 1), current status of EES implementation is shown in Fig.2-2. The mandatory limited values of energy efficiency are mainly used for eliminating high intensity energy consuming products. The mandatory China Energy Label uses energy efficiency grade in EES as technical reference for implementation. The voluntary energy conservation product certification is based on the evaluating values of energy conservation in EES.

In addition to energy label and certification system of energy conservation product, other implementation measures of EES should also include government procurement system, quality supervision and random inspection system, as well as some voluntary acts. Introductions to them are given below.

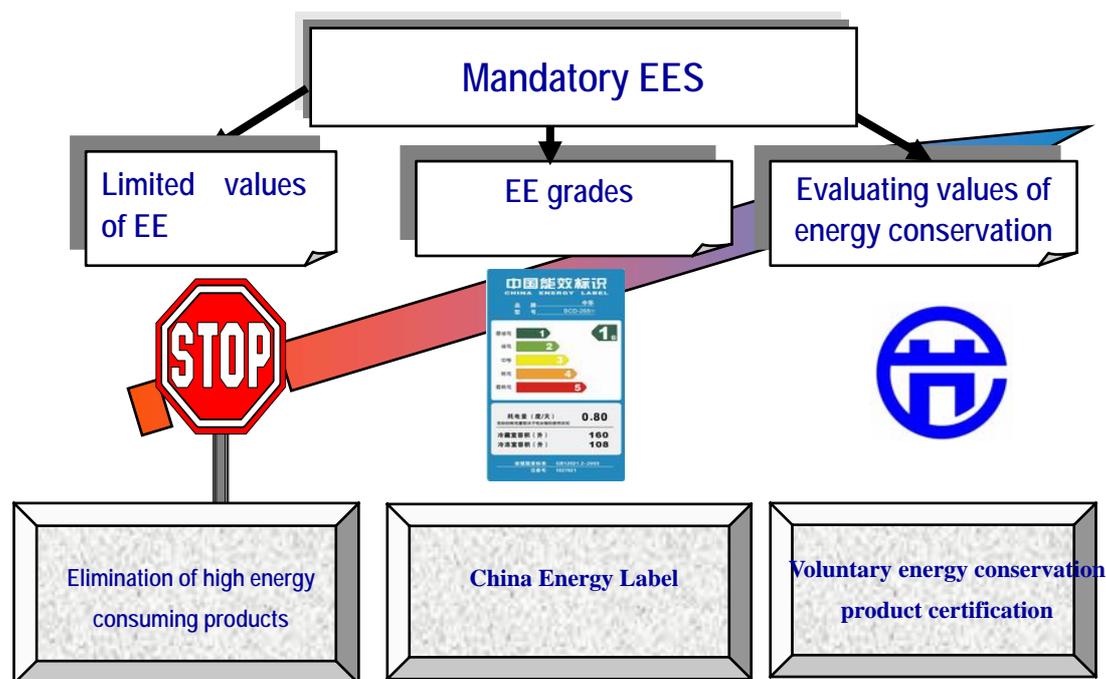


Fig.2-2 Sketch Map of Current Status of EES Implementation in China

1. Mandatory energy efficiency labeling system

In August, 2004, NDRC and AQSIQ officially issued the “Management Method of Energy Efficiency Label” as the No. 17 decree, which meant that the energy efficiency labeling system was officially established in China. This system belongs to mandatory label (mark) system.

On March 1, 2005, mandatory energy efficiency system was officially launched in China for

household refrigerators and room air conditioners. Most enterprise put energy labels on related products and submitted application materials to authorized agencies for registration according to relevant requirements of the “Management Method of Energy Efficiency Label”. By October 2005, there were 2,100 types of 78 household refrigerator manufacturers, and 4,123 types of 68 room air conditioner manufacturers, amounting to 6,223 types of products and 146 enterprises submitted application materials of energy efficiency labeling. Among them, totally 111 enterprises passed filing procedures, including 53 household refrigerator manufacturers and 58 air conditioner manufacturers⁽¹⁾.

Tab.2-1 and Tab.2-2 conduct a comparison of energy efficiency level between related products before and after energy label implementation. From that we can tell, though the energy labeling system has been implemented for just over 8 months (data statistics up to October 2005), the achievements are significant. For example, before March 1, air conditioners with energy efficiency being lower than Grade 5 took 31.4% of total market volume, while all air conditioners manufactured after March 1 have reached Grade 5 or higher, and regenerators with Grade 1 energy efficiency even increased 15.2%. Therefore, the implementation of energy labeling system have effectively boosted production and sales of high efficiency products, and driven refrigerator and air conditioner manufacturers to continually develop new energy saving products, while energy efficiency levels of products have been improved apparently.

Tab.2-1 Comparison of Energy Efficiency of Room Air Conditioners before and after the Implementation of Energy Labeling system

	Market Share of products of Different Grades (%)			
	Grade 1	Grade 2	Grade 5	< Grade 5
Products manufactured between Mar. 1 to Oct.	2.6%	4.3%	69.4%	0%
Products manufactured before Mar. 1	1.2%	1.1%	47.7%	31.4%
Growth Rate	1.4%	3.2%	21.7%	-31.4%

Tab.2-2 Comparison of Energy Efficiency of Household Refrigerators before and after the Implementation of Energy Labeling system

	Market Share of products of Different Grades (%)			
	Grade 1	Grade 2	Grade 5	< Grade 5
Products manufactured between Mar. 1 to Oct.	41.6%	34.9%	3.3%	0%
Products manufactured before Mar. 1	26.4%	32.3%	6.1%	4.1%

Growth Rate	15.2%	2.6%	-2.8%	-4.1%
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Source: authorized energy label agency

2. Government procurement

In Dec. 2004, Ministry of Finance (MOF) and NDRC co-published the “*Implementation Opinions on Government Procurement of Energy Conservation Products*”. The Implementation Opinions requires that all levels of state agencies, public institutions and incorporations, when procure with financial funds, under the same conditions of technical and service indices, should give priority to procurement of energy and water saving products listed in the Implementation Opinions, and gradually eliminate high energy consuming products. This document also published the list of first group of energy and water saving products, involving over 100 types of such 8 categories as air conditioner, refrigerator, fluorescent lamp, TV set, computer, printer, water tap, toilet. The “List of Energy Conservation Products for Government Procurement” is not valid permanently after publication, and MOF and NDRC would enlarge and adjust timely and reasonably the scope of energy conservation products for government procurement according to actual conditions of economy development in China, and add and publish additional energy conservation products meeting requirements. Energy conservation products already been listed, would be cleared out timely if their term of validity expire or any index failing to meet relevant requirements; enterprises and their products not yet been listed, would be added into the list timely after being certified to comply with all requirements. For this, in April 2005, MOF and NDRC co-issued the Circular on Adjusting the List of Energy Conservation Products for Government Procurement”, to adjust for the first time the list of energy conservation products for government procurement.

3. System of quality supervision and spot checking

National supervision and spot checking of product quality are acts taken by product quality supervision department (namely, NDRC) under the State Council to organize according to law relevant provincial quality and technical supervision departments and product quality inspection agencies to carry out sampling and inspection of products produced and marketed, and announces according to law the results of spot checking and treatment adopted. The national supervision and spot checking is one of the main methods of conducting supervision and inspection of product quality by the State.

National supervision and spot checking has two types, namely, regular and irregular national supervision and spot checking. Regular national supervision and spot checking shall be conducted every quarter, and national supervision and special spot checking shall be conducted irregularly according to status of product quality. For procedures of supervision and random inspection please see Fig. 2-3. The references for quality determination of national supervision and random inspection are national standards, trade standards, local standards and relevant national requirements in relation to the products inspected, as well as enterprise standards and quality

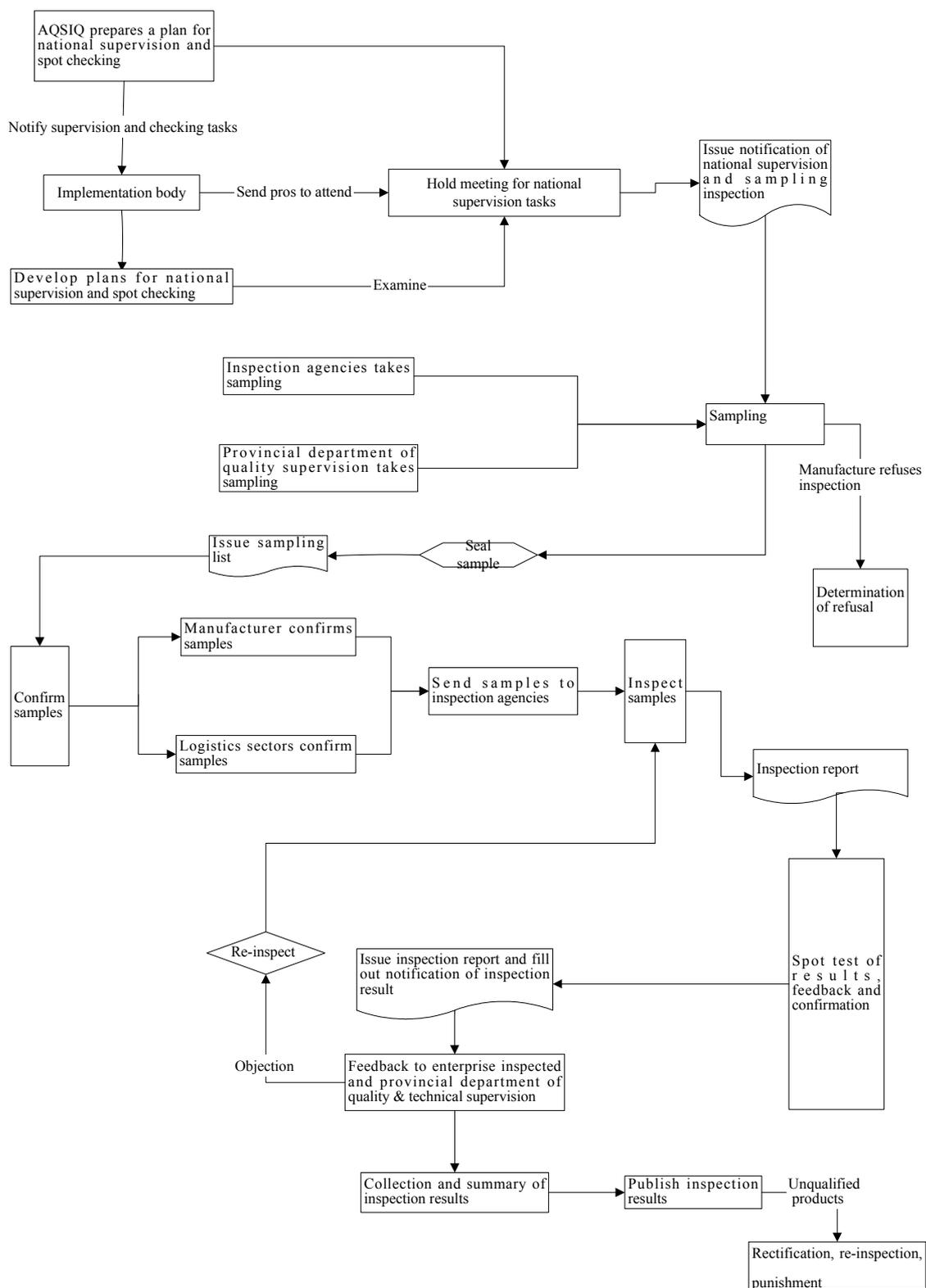


Fig. 2-3 Flowchart of National Supervision and Spot Checking of Product Quality

commitments explicitly stated by the enterprise. National supervision and spot checking shall not charge enterprise for inspection, and the expenses needed by national supervision and random inspection will be covered by special appropriation arranged by finance department. Appropriation for national supervision and spot checking provided by finance department shall be subjected to unified management and used by AQSIQ.

Products subjected to national supervision and spot checking mainly include products concerning human health, personal and property safety, industry products essential to the national economy and the people's livelihood, and products having quality defects according to users, consumers and related organizations. For example, in order to protect personal health and property safety, intensify quality consciousness of enterprises, and regulate development of the trade of household electric washing machine, AQSIQ conducted national supervision and spot checking in 2005 on product quality of household electric washing machine. 30 types of products manufactured by 30 enterprises were inspected, of which 29 passed, with the sampling acceptance rate being 96.7%. Among them, 3 types of drum-type washing machines were inspected with the sampling acceptance rate being 100%; 27 types of impeller-type washing machines were inspected, and 26 of them passed with the sampling acceptance rate being 96.3%⁽²⁾. Results of the random inspections show that safety indices and performance indices of products manufactured by a great majority of enterprises basically could meet requirements of requirements.

Additionally, in the fourth quarter of 2005, AQSIQ conducted sampling inspection⁽³⁾ on foods, articles of daily use, and industrial and agricultural means of production. 3954 types of products manufactured by 3527 enterprises in 78 trades were inspected, with the sampling acceptance rate being 76.2%. Among them, articles of daily use inspected included household refrigerators, of which such safety indices and performance indices as noise, power consumption, and energy efficiency etc. were inspected, with all results of inspection meeting requirements of national standards, and the sampling acceptance rate being 100%⁽²⁾.

Among them, the inspection of energy efficiency was conducted according to the limited values of energy efficiency stipulated in GB12021.2—2003 “*The Maximum Allowable Values of the Energy Consumption and Grading Criteria for Household Refrigerator*”. It is notable that during sampling inspection of washing machines, the energy efficiency indices were not included.

4. Voluntary certification (certification of energy conservation products)

Voluntary certification are mainly driven by the market, which is independently conducted by authorized and accredited certification institutions for products, services and management systems in their approved scope, and the certification marks are not required to be unified. Standards adopted by voluntary certification can be either national standards, or associational standards.

In 1998, China officially established certification system of energy conservation products, and setup China Committee for Certification of Energy Conservation Product (CCEC) and China Certification Center for Energy Conservation Product (CECP). Energy conservation product

certification in China means the activity of CECP confirming and proving a certain product is energy conservation product by issuing a certificate of energy conservation product according to relevant standards and technical requirements for certification, which belongs to a category of endorsement label, adopts the principle of volunteerism, being similar to the program of “Energy Star” of USA. Energy conservation product certification in China adopts the international certification practice of “plant conditions inspection + product inspection + supervision, examination and inspection after certification”, belonging to the scope of product quality certification.

By now, products adopting energy conservation involve 17 products of 5 categories of household appliance, lighting, mechanics, electric power, water conservation, including household refrigerators, room air conditioners, ballast for fluorescent lamp, ballast for high pressure sodium lamp, trap for AC power system, displacement air compressors, microwave oven, electric heaters, electric rice cooker, small and medium three-phase asynchronous motors, electric instruments etc⁽⁴⁾.

III. Problems & Barriers

(I) Incomplete law and regulation system, inadequate punishment

According to experience of developed countries, voluntary implementation of technical standards requires a complete law system of rights, obligations, responsibilities in relation to the market subject, so that the market could have incentive influences on implementation of standards. At present, all developed market economy countries are adopting the principle of strict liabilities for product liabilities, namely, compensation must be made for any tortuous act, and the amount of compensation often reaches millions of dollars⁽⁵⁾.

Though the Standardization Law of China does stipulate supervision of mandatory standards implementation and legal liabilities, the operability of mandatory standards implementation is poor, which is caused by unclassified product types, degree of harmfulness of product and degree of punishment, and different approval assessment means, besides, law enforcement subject are deployed in different departments with inexplicit responsibilities. And although the “*Regulations for the Implementation of the Standardization Law of the People's Republic of China*” does have provisions concerning implementation and supervision of standards, as well as requirements of punishment on acts of not implementing standards, little observation of laws and inexact law enforcement are prevailing, being an opportunity exploited by some illegal manufacturers driven only by profits, which leads to fake, poor quality products on market.

The energy labeling system has just started in our country, so strengthened supervision for guaranteed authenticity of label information is the key to establishment of system authority and solemnity as well as to smooth implementation of the system. The implementation mode of energy labeling system in China is “manufacturer/importer self-declaration+ record keeping + social monitoring”. At present, some enterprises attempt to make a convenience of “self declaration” to fish in troubled waters, marking false information on energy labels, which is seriously harming consumers’ interests. For the “social monitoring” part, there is no management rule concerning punishment means and degrees on violations.

In addition, the “Energy Conservation Law of the People’s Republic of China” explicitly stipulates that an elimination system shall be implemented on high energy consuming products, however, no supporting management method or implementation regulation etc. is developed.

(II) Incomplete market supervision system

For implementation of EES, such measures as China Energy Label, government procurement and

energy conservation product certification etc. are taken. However, the mandatory limited values of energy consumption are complied by manufacturers voluntarily, with no government or market supervision. Therefore, manufactures often exaggerate their energy efficiency, namely, the discrepancy between labeled values and measured values of energy efficiency is too big to be in reasonable range. According to the survey of air conditions by Shanghai Energy Conservation Supervision Center (SECSC)⁽⁶⁾, the State conducted only a few supervision and inspection on air conditioners per year, and the supervision strength is too weak to make the market to pay attention to energy efficiency of air conditioners. Many manufacturers hope the State can strengthen supervision and inspection so as to foster a canonical market of fair competition.

(III) Lack of incentive mechanism

According to the report of “Assessment of EES Implementation Status of Household Appliances in China”⁽⁷⁾, this study program used questionnaires to conduct surveys on 12 refrigerator manufacturers and 15 air conditioner manufacturers, including all large enterprises and several typical medium and small enterprises.

As for refrigerator manufacturers, 92% of enterprises surveyed stated that, for implementation of standards of 2003 edition, they need to make change in product design, with the percentage of products being involved being 30% averagely. In order to improve energy efficiency level of products, manufacturers mainly conduct improvement in four aspects: (1) adopting high efficiency compressors or variable-frequency compressors; (2) improving system matching, and optimizing chilling system; (3) thickening foam layer, or using vacuum insulation plate; and (4) altering refrigerating mode (from air-cooling mode to direct cooling mode to combined mode of air-cooling and direct cooling). For theses four modifications, expenses range from hundreds of thousands Yuan to tens of millions Yuan, and time needed range from half year to a couple of years.

As for air conditioner manufacturers, half (53%) of enterprises surveyed stated that, for implementation of standards, they need to make change in product design in order to meet requirements of new standards, with the percentage of products being involved 22.5% averagely. In order to improve energy efficiency level of products, manufacturers mainly take such measures on product design as: improving design of chilling circuit, and add the heat exchanging capacity thereof; using high efficiency compressor, improving system matching, and optimizing chilling system; and using high efficiency key parts (like variable frequency controller) etc. Completion these modifications need half to one year, and millions Yuan of money.

Results of the survey show that, in order to meet requirements of EES, enterprises need to carry out technical improvement, which will cause increase of cost. The current market status in china is that most consumers would pay more attention to product price rather than energy efficiency

which means they prefer to buy cheaper products. Therefore, under the circumstances of no favorable policies are provided, enterprises are short of enthusiasm for manufacturing products with higher energy efficiency; and without any allowance, consumers are short of enthusiasm for buying higher energy efficient products.

In addition, since China launched the energy-efficient refrigerator sponsored by Global Environment Facility (GEF), thanks to great promotion of government, some progresses have been made. However, the program also encountered some difficulties during implementation, the popularity rate of energy-efficient refrigerators in market is still low, and there are still some barriers on large scaled commercialization of energy-efficient refrigerators. According to surveys, these difficulties include: senses of environment protection and energy conservation of the general public need to be improved, and consumers would pay more attention to the initial purchase cost and neglect refrigerator's use-cost i.e. benefits from energy efficiency; refrigerator retailers, worrying about increased price would lead to sale resistance, have little enthusiasm for selling energy-efficient refrigerators⁽⁸⁾.

(IV) Unready publicity and education, general public in need for related knowledge

According to related data, many manufacturers do not implement energy efficiency requirements for relevant products, and some even do not know there are mandatory EES.

Results of an assessment study conducted by CHEAA, Energy Foundation (EF) and American Council for an Energy Efficient Economy (ACEEE), show that⁽⁷⁾ there are still some problems in development, implementation, supervision of EES and generalization of energy conservation products, which all are influencing factors of the standards. Since the supporting government incentive policies and publicity programs are inadequate, EES, energy conservation products and energy conservation certification presently are short of recognition and influence among the general public, which to some extent is affecting the overall improvement of energy efficiency of household appliances.

Besides, publicity and advertisement of energy conservation products are misleading to some extent. For example, some manufacturers, after conducting energy conservation certification for just a few products of certain specifications, would state in their commercials that all of their products are energy efficient, which is misleading consumers and affecting social credibility of energy conservation products.

IV. Framework of EES Implementation and Monitoring System in China

(I) Inspirations from international experience for implementation of EES and energy label in China

There is an old Chinese saying goes “hard stone from another country can carve jade”. To summarize experience of EES implementation in various countries, implementation mechanisms can be divided into several categories: 1) supervision and examination undertaken by governments: Australian mode; 2) self-certification in local policy framework: EU mode; 3) privately-operated certification: American mode; 4) certification under government's control: Tunisian and Philippine mode (for details, please see International Experience in Appendix I). These show that, based on different economy scales and economy development levels, various countries adopt different implementation modes. Among them, both the EU mode and the American mode attach great importance to social monitoring mechanism, such as certification by a third party and trade self-certification, which is suitable for the development degree of their economy.

1. Government paying close attention to and setup special agencies for EES and energy label work

Although Australia has abundant resources with the energy output being greatly larger than energy consumption, the energy consumption structure is mainly occupied by coal, and the greenhouse gas emission per capita is comparatively high. Therefore, Australia has paid close attention to improvement of energy efficiency of end energy-using product, and has taken effective measures to promote development of energy efficiency. As for public finance, the Government setup special funds to increase energy conservation investment for improving energy efficiency and reducing greenhouse gas emission.

The Australia government has setup explicit target for emission reduction of greenhouse gas, and target for improvement of energy efficiency or economy growth. Besides, in order to guarantee realization of all targets, the government has paid great efforts to mechanism establishment, and setup a special agency (Australian Greenhouse Office, AGO) for EES and energy label work. Another example is the Danish Energy Authority (DEA), which is a government agency responsible for supervision of EES implementation ⁽⁹⁾. If another department takes this responsibility at the same time, scattered attention surely would lead to insufficient staffing, which would affect the implementation effect of EES and label system. From this we should draw some

lessons.

2. Establishing EES and labeling system with high level and strict requirements

Australia and New Zealand are developed market economy countries, which attach great importance to adoption of demand-side management method for guiding products, especially household appliances to higher energy efficiency level: 1) developing and implementing minimum EES, to eliminating high energy consuming products from market; 2) establishing and implementing energy efficiency labeling system, to lead development of energy-efficient products. These have had active influence on regulating market of energy consuming products. Besides, for development of EES and energy label, they “copied” advanced standards of foreign countries, which not only guarantees advanced standards, but also saves considerable amounts of human and material resources. China is a developing country with backward aspects, but we can learn from unsuccessful and successful experience of developed countries to find a shortcut. Although there would be some difficulties in directly “copying” advanced energy efficiency indices of foreign countries, we may try to copy them as “targeted values”.

3. Powerful supervision strength of implementation of EES and energy efficiency label; wide participation by enterprises

For implementation of energy efficiency policies, experience of various countries all attaches importance to sufficient participation by every stakeholder and wide coordination. The government selects competent organization as implementation institution which is responsible for publicity, promotion, experiment of the policy, and communication with trade associations. The implementation of policies would be guaranteed by legal measures, involvement of trade associations, enterprise self-discipline and consumers’ supervision, and supported by reward and punishment measures, so that enterprise and individual could change gradually from passive recipients into active participants.

For example, The Energy Saving Trust (UK)⁽¹⁰⁾ is a non-profit organization established in 1992 by UK government and some energy companies mainly to encourage local governments to improve energy efficiency for residents, small commercial and industrial users. Its main tasks are: advertising and marketing energy conservation; establishing local EE center network; encouraging usage of high energy efficient standards and equipment; encouraging local governments to implement energy efficiency strategy for new housing buildings; experimenting and developing cars, taxis, buses and commercial cars driven by environment-friendly fuels.

The Australia government, during the process of boosting energy conservation and improving energy efficiency, has established a rather complete intermediary agency system⁽⁹⁾. The active cooperation of associations and testing and assessing institutions guarantees smooth implementation of government’s EES and label policies. EES and label works in Australia are conducted by sustainable energy agencies and electric power supervision centers distributed in all states and territories. For specific detailed issues, appropriate measures will be taken, and specific

associations and enterprises will participate. During this process, incentive policies as well as strict punishment on violations are prepared, from which we should draw lessons for implementation of EES and energy label system and other activities concerning energy conservation, so as to overcome the disadvantages of unclear reward and punishment with much cry and little wool.

4. Public education, training and information dissemination

During implementation of policies, attention is paid to the combination of “soft” and “hard” measurements, and software construction such as information dissemination, training, education and consultancy are strengthened, with the expectations of good return. The government invests on implementation acts, and implementation institutions conduct publicity and promotion of policies. These are methods adopted by many countries.

Energy conservation and environment protection are issues concerning the whole world, and only when every one in the society recognizes the importance of energy conservation and takes active measures, can the optimal energy conservation effects be achieved. Acceptance of highly efficient products by the general public is not nature even in developed countries. Surveys show that Australians and New Zealanders used to pick cheaper products with only basic functions when buying energy consuming products, and often they did not consider the energy efficiency and economic benefits during the entire service life. In such developed countries as Australia and New Zealand, broad publicity with large amount of time and manpower being invested is also needed, in order to popularize energy conservation knowledge into every person and infuse energy efficiency consciousness into every corner of the society. With this background, both governments made great efforts to conduct publicity and promotion, such as media publicity, brochures, Energy Wise activity and various promotion programs of energy efficiency. In the Energy Efficiency and Conservation Authority of New Zealand delicate brochures and periodicals can be seen everywhere, and advertisements and commercials of energy-efficient products are often shown on TV in Australia and New Zealand. All of these measures are imperceptibly influencing energy efficiency concept of every people, and are increasing people’s consciousness of energy efficiency, and letting concept and consciousness of energy conservation and energy efficiency moving into every corner of the society.

The modern information dissemination tool—the Internet is also an important channel. For example, the Office of Energy Efficiency (OEE) of Canada post on their website the compact fluorescent lamps (CFL) with the “Energy Star” mark have such outstanding features as: able to save 75% energy compared with incandescent lamps, service life being at least 5 years (3 hours per day), suitable for most light fittings, providing excellent lighting effects, the amount of money saved being more than extra amount paid when buying, being a simple way to reduce emission of greenhouse gases, etc. Through these means, OEE encourages and promotes consumers to buy CFLs.

5. Incentive measures

Incentive measures usually include financial subsidies, tax preference, award system, and bulk purchase etc. International experience shows that incentive measures are very important for policy implementation. Government subsidy is one of effective means for promoting development of energy-efficient products in developed countries and regions. For instance, Netherlands government, when implementing EU energy label scheme, would provide 100 Euros per refrigerator with Grade A as subsidy to buyers. According to statistics made by EU Joint Research Center in 2002⁽¹¹⁾, this measure made the market share of Grade A refrigerators in Netherlands being as high as 71.1%, much higher than the average level of 39.1% in 10 EU countries. In 2001, 40 state-level departments and public utilities of USA provided 0.133 billion dollars for rebate program, so as to encourage users to buy energy saving appliances and lighting products certified by the “Energy Star”.

Japan, besides providing subsidies to programs for popularization and demonstration of energy saving products, prepares such favorable policies as extraordinary depreciation and reduction and exemption of taxes; and policy-related banks also provide low-interest loans⁽¹²⁾.

Besides, technical bidding as a successful incentive measure can drive manufacturers to commercialize new energy-efficient products. In 1990, NUTEK (Sweden) conducted the first technical bidding invitation for energy efficiency, which required buying refrigerators with the energy efficiency being much higher than the best products in market. The result was that the energy efficiency of the products won the bid was significantly higher than the EES just issued by EU⁽¹³⁾. Another example is the Super-Efficient Refrigerator Program (SERP) sponsored by 24 appliance institutions of USA, which prepared a prize of 30 million dollars for any manufacturer that produced 250,000 refrigerators with the energy efficiency being at least 25% higher than the refrigerator standard of 1993 in USA. Eventually, energy efficiency of products won the prize was about 30% higher⁽¹⁴⁾.

Other incentive mechanisms include recognition, awarding honors and increasing enterprise reputation. Take the “Green Light Program”⁽¹⁵⁾ of EU for example, although the EU Commission does not provide any fiscal aid for upgrade and generation change of lighting system, it supports partners with information resources and honors, such as exclusive use of monuments, advertisements, networks and marks on building, as well as various awards. Partners’ other benefits include: reduced cost, better lighting environments (a benefit for employees and customers), technical assistance and investment from energy service companies, the rights to announce they participated in programs of reducing CO₂ emission and are “green or environment-conscious company”, and free publicity by EU Commission and other authorized institutions.

Japan also adopts recognition method to inspire enterprises’ enthusiasms for energy conservation. For example, the Ministry of Economy, Trade and Industry publishes catalogue periodically of energy conservation products, conducts activities to apprise excellent enterprise, and setup the Minister of Economy, Trade and Industry Award, the Director-General of Agency for Natural

Resources and Energy's Prize, Energy Conservation Center Chairman's Prize⁽¹²⁾.

(II) Framework of EES implementation and supervision in China

1. Features of implementation system of new technical standards in China

According to study achievements of the major science and technology project—"Research on Establishment of National Technical Standard System" launched by Ministry of Science and Technology⁽¹⁶⁾, features of the new technical standard system currently under discussion in China are: all implementation modes and establishment of all systems are enterprise-based; intermediary agencies according to their own natures provides services; especially various certification organizations and test and inspection institutions, being intermediary agencies, shall be operated by general adoption of the market principle; main tasks of government are developing regulations and policies, strengthening supervision, and leading enterprises to form self-discipline mechanism.

2. Supporting environment for establishment of technical standard system

(1) The mechanism of government supervision and social monitoring

The mechanism of government supervision and social monitoring is indispensable during implementation of technical standards. Government supervision adopts different modes of supervisions according to supervised objects, such as report system, questioning system, system of reporting offences to the authorities, posting system and sampling inspection system etc. The social monitoring mechanism are mainly made up of such related parties as government departments, enterprise, users, consumers, intermediary agencies and associations, media, etc., with the monitoring modes including self-inspection and self-correction of associations, mutual supervision among enterprises, and publication of lists, etc. Other measures are consumers' complaints, media exposure, and public announcement etc.

(2) The management mechanism with organic combination of technical standards and conformity assessment

The implementation of quality certification is an international practice to assess and supervise product quality and enterprise management. Conformity assessment and standards are interdependent: without standards, conformity assessment would have no reference; without conformity assessment, implementation of standards would be limited. Therefore, these two aspects are organically combined and are complementing each other.

Since 1900s, developed countries like USA, European countries and Japan started to establish certification system which, up to now, has spread among products and services of all trades. Europe, the cradle of conformity assessment system, through long development has fostered great market recognition and credibility, and its conformity assessment system are accepted and adopted

by all countries in the world. Comparatively, China had a late start. In China since 1994, AQSIQ has successively established China National Accreditation Council for Registrars (CNACR), China National Registration Board for Auditors (CRBA), China National Accreditation Council for Production (CNACP), and China National Accreditation Committee for Laboratories (CNACL). These four accreditation/registration institutions are four pillars of conformity assessment and accreditation system of China, playing great roles in the course of quality certification (conformity assessment) development in China.

(3) Inspection and testing resources

Inspections and tests are essential foundations for measuring whether technical standards are effectively implemented, and are technical support for and most import link of guaranteeing successful execution of such implementation measures as conformity assessment, product quality sampling inspection, information label (mark) and enterprise self-declaration. USA, Europe and Japan are all attaching great importance to establishment of inspection and testing laboratories. Take Japan for example, laboratories competent to conduct tests must be accredited by the Minister, Ministry of Economy of Japan before undertaking product tests for certification. As for technical equipment and technical means, Japan has up-to-date instruments and advanced technical specialists. Inspection and testing are also very important infrastructures of implementation system of new technical standards in China.

(4) Other resources

Realization of a system requires support by certain resources, which is a key link for effective implementation of every system and an indispensable component of the system as well. For implementation system of technical standards, the most important material supports are talents, funds and information system. The establishment of complete material support system will help the realization of all functions of implementation system of technical standards, and will boost effective implementation of technical standards.

3. The framework of EES implementation and supervision mechanism in China

The implementation and supervision of EES is a systematic project, involving a good number of government departments, enterprises and intermediary agencies, and requiring a strong supporting environment as well as mandatory and voluntary implementation measures. Therefore, how to construct an implementation system for EES to bring EES into a full play is a problem waiting to be solved.

According to features of implementation system of new technical standards as well as supporting conditions, and based on EES implementation conditions and existing implementation measures, the implementation mechanism framework is to be constructed as shown in Fig.4-1.

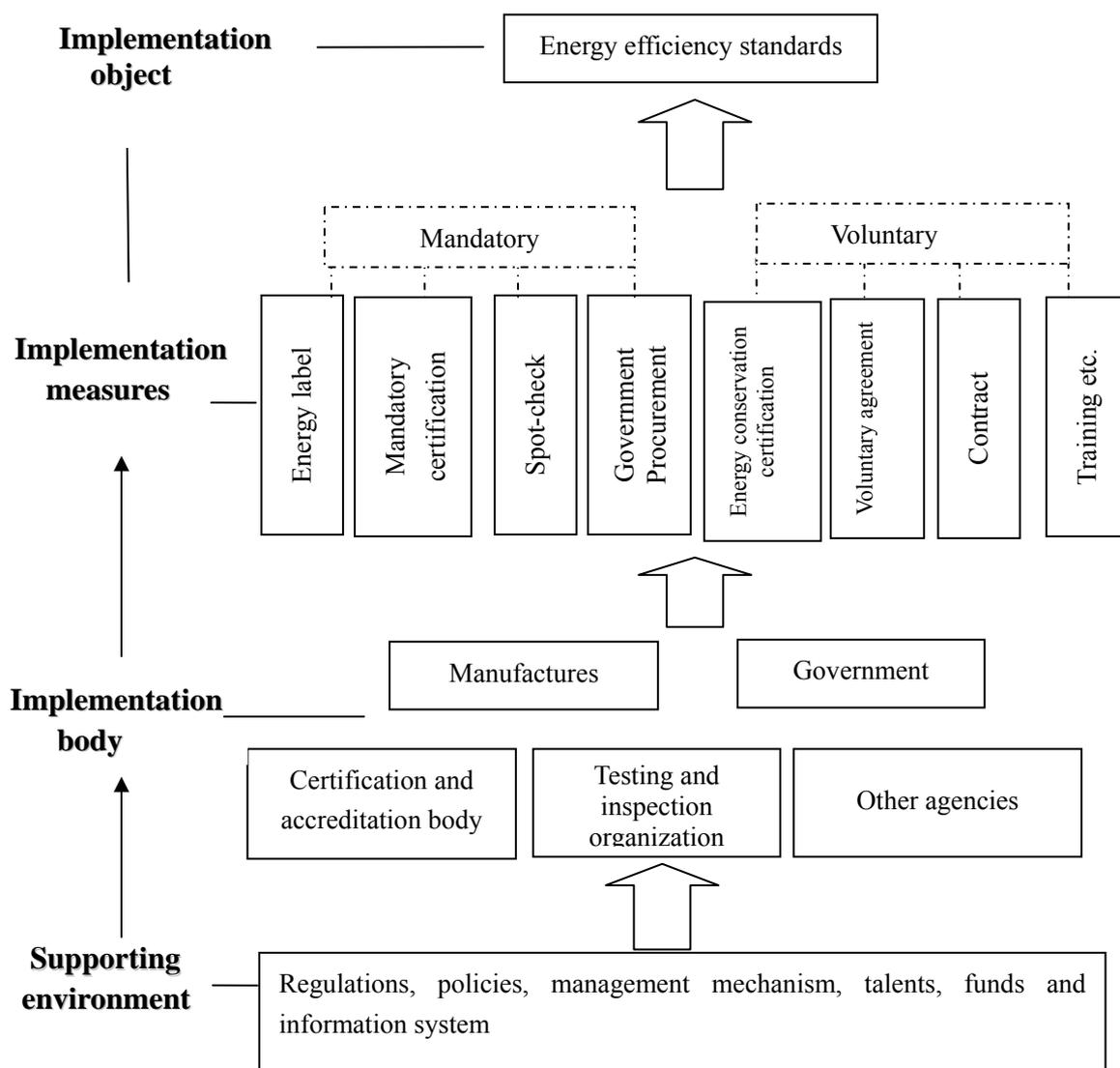


Fig.4-1 Framework of EES Implementation Mechanism

Summarizing implementation modes of various countries, and based on current economic development condition in China, namely the transition period from planned economy to market economy as well as the above-mentioned difficulties during implementation progress, we suggest we shall not only enforce supervision of government, but also establish a social monitoring mechanism.

(III) Policy suggestions

Based on the abovementioned framework of EES implementation mechanism, suggestions are made in terms of supporting environment, implementation bodies, implementation measures and

social monitoring mechanism respectively.

1. Supporting environment

(1) Perfect the law system for EES formulation, implementation and supervision, and the management and operation mechanism

From difficulties encountered during EES implementation, we can tell the law system for EES formulation, implementation and supervision, and management and operation mechanism, are not complete and need to be enriched and specified. Therefore, this section discusses about the completion of law and regulation system.

① Study to formulate the “*Management Method of Energy Efficiency Standardization*”

By learning from the already promulgated “*Management Method of Energy Efficiency Label*” and “*Management Method of Energy Conservation Products Certification*”, prepare management methods for research and formulation, implementation and supervision of EES; specify responsibilities and obligations of each party during the progress of research, formulation and supervision; and complement and specify unclear contents and frameworks in law system. Especially for supervision and management, confirm EES indices will be listed into the scope of national product quality supervision and spot checking. At present, this research project has finished the draft of the “*Management Method of Energy Efficiency Standardization*”, and will widely collect opinions and suggestions for revision and then draft for approval.

② Establish as soon as possible the elimination scheme for high energy consuming products

The elimination scheme for high energy consuming equipment and products is an integrated operation and management mechanism of supervision, accreditation, testing and arbitration, an important macroscopic management method under market economy system proposed by the “*Energy Conservation Law of the People’s Republic of China*”, and a market economy management model to regulate, guide, adjust and control energy consuming equipment and product market. The goal of establishing the elimination scheme for high energy consuming products is to set up a social mechanism for regularly elimination of high energy consuming equipment and products, so as to promote the advancement of energy conservation technology, the improvement of energy efficiency, and the renovation and modification of energy consuming products and equipment.

Implementation of the elimination scheme for high energy consuming equipment and products requires supports from EES, so as to decide a product or equipment whether should be eliminated due to high energy consumption according to the limited values of energy efficiency stipulated in EES, and to judge a manufacturer of energy consuming products or equipment whether illegally produces or not. Therefore, the elimination scheme for high energy consuming equipment and products is a necessary condition for EES implementation in China, and an important law foundation for complete and deep implementation of standards.

The elimination scheme for high energy consuming equipment and products will have significant influences on the perfection of energy conservation management system in market economy of

China. Market economy is legalized economy, and the elimination scheme for high energy consuming equipment is an important component of the “Energy Conservation Law”;

The scheme will be beneficial to the optimized configuration of energy resources, and will use laws to restrict illegal acts of wasting energy⁽¹⁷⁾.

③ Establish mandatory certification scheme for the limited values of energy efficiency

Since mandatory limited values of energy efficiency are core indices of EES, so the establishment of mandatory certification scheme for the limited values is also an effective means. For example, the Energy Efficiency Act enacted in 1992 in Canada explicitly stipulates: all target products must bear conformity mark provided by the Standard Council of Canada, a certification agency authorized by government, so as to certify this product has passed tests and meets requirements of EES. Natural Resources Canada is responsible for conducting market research and market spot tests to inspect conformity status of products; collecting information from inspection and testing agencies (from reports and database); and conducting independent energy efficiency tests for products. Manufacturers and dealers also have their responsibilities to take according to law⁽⁹⁾.

We suggest, therefore, learning experience for Canada and taking use of the existing 3C certification scheme, to establish a mandatory certification scheme for the limited values of energy efficiency.

④ As per the national system of production license for industrial products, establish a mandatory system of production licenses for energy consuming products

The system of production license for industrial products is an administrative license system setup by the competent department of production license for industrial products under the State Council, to conduct on-spot check and product inspection on enterprises manufacturing processed goods concerning human health, products endangering personal and property safety, products concerning finance security and communication quality, products guaranteeing labor safety, products affecting production safety and public safety, and products required to carry out production license management manufactured pursuant to the “Management Regulations” according to laws and regulations, to confirm that the enterprise is competent to continually manufacture qualified products, issue the production license, and permit the enterprise to conduct production, so as to guarantee quality safety of major industrial products directly concerning public security, human health, life and property safety, carry out national trade policies, and promote healthy and harmonious development of socialist market economy. This system stipulates that a manufacturing enterprise shall possess basic conditions to guarantee quality safety of products and obtain production licenses according to due procedures before any practice of manufacturing products concerned. Without a production license, an enterprise shall not manufacture products managed by the system of production license. Any unit or individual shall not sell or use during operation products which have not obtained production licenses. Enterprises obtained the production license shall submit their self-inspection report to competent departments in charge of production licenses for industrial products of the province, autonomous region, or municipality directly under the

Central Government; competent departments in charge of production licenses for industrial products in the people's government above county level shall organize supervision and inspection in regular or irregular terms to drive any enterprise being certain about steady and qualified product quality, and shall not lower requirements for obtaining production licenses.

The system of production licenses for industrial products in China started in 1980s. The "Regulation of the People's Republic of China on the Administration of Production License for Industrial Products" was adopted at the 97th Executive Meeting of the State Council on June 29, 2005, promulgated by Decree No.440 of the State Council on July 9, and effective as of the date of September 1, 2005. On September 15, 2005, AQSIQ issued the "Measures for the Implementation of the Regulation of the People's Republic of China on the Administration of Production License for Industrial Products" (by Decree No.80 of AQSIQ), then promulgated a series of related regulations. Gradually, the administration system of "unified administration, cooperation based on division of labor, prominence to the key points, regulated procedures" was established, and the system of production license for industrial products are advancing perfection day by day, which are more suitable for development of China's market economy.

Since 1984, over 140,000 production licenses for more than 400 types of products have been issued to over 130,000 enterprises through out the country. Especially in recent years, 45,000 production licenses have been issued to 370 types of food manufacturing enterprises of 28 categories through out the country, and the market access system for food quality safety with the production licenses being a major content has been successfully implemented.

At present, the operation mechanism of the system of production license for industrial products is: unified administration by AQSIQ, implementation organized by provincial bureau of quality technical supervision, and participated by related departments under the State Council and associations, supervision and treatment by local bureau of quality technical supervision. Therefore, if production and energy consuming products is listed into a mandatory system of production license, the existing operation mechanism of the system of production licenses for industrial products can be utilized to establish a market access system, broaden implementation channels of EES, and maximally enforce functions of EES, and cost of implementation can be saved, an effect of getting twice the result with half the effort.

(2) Information system

As a component of supporting environment for EES implementation framework, information system can take full use of the powerful Internet to establish an EE database of products as well as a public information system. The EE database of products provides performance, market data, and future market prediction etc. of products. And the public information system publishes policy-making information, standard-developing status; provides introductions to existing laws, regulations and policies as well as voluntary agreements between government and enterprises; and prepares an information exchange platform for formulation, implementation and supervision of EES, and a participating means for the general public.

This project, with help from the official energy efficiency label website of China (www.energylabel.gov.cn), is conducting research on establishment of information system.

2. Implementation bodies

(1) Government

According to study achievements of the major science and technology project—“Research on Establishment of National Technical Standard System” launched by Ministry of Science and Technology, the new technical standard implementation system requires to remold government’s functions which mainly include: study to formulate relevant laws and regulations, including the establishment of technical regulation system; prefect market access system; drive implementation of various mandatory systems, and strengthen market supervision and administration; supervise intermediary certification and accreditation agencies; provides such services as instruction, generalization, information and arbitration for implementation of standards. These requirements are also applicable to EES implementation and supervision.

(2) Enterprises

Being independent market subjects, enterprises are also the first implementer of standards. Enterprises, being led by market and guided by government, should fully enforce their features of self-discipline and activity, to effectively and voluntarily implement standards in such links as production, service and trade etc.

In USA, manufacturers’ participation in EES implementation and supervision has two sides: on the one side they shall submit a certification report, containing EE data of products as well as complete conformity statement, to the Department of Energy; on the other, may inform government against competitors’ nonconformity⁽⁹⁾. The former is mandatory, while the latter is voluntary and is driven by profits.

In China, similar requirements could also be made for enterprises. For example, to require enterprises to submit EE data of products to appointed institutions for records keeping, supervision and inspection; on the other hand, to encourage enterprise to voluntarily satisfy requirements of EES.

Due to national conditions and cultural factors of China, ordinary enterprises would have little enthusiasm for informing against other enterprise. However, the establishment of effective report system, including smooth report channel, explicit report-accepting institution, method of verification, and applicable treatment method, can be an organic component of EES implementation and supervision mechanism of China.

(3) Intermediary agencies

Intermediary agencies of China recovered and developed since 1980s. Along with gradual perfection of market economy system, functions of government will undergo further transition, namely, the economy management will transit from direct-management dominated mode to indirect-management dominated mode. Among others, one important means is to draw support

from intermediary agencies, and fully enforce their functions as bridges linking government with enterprises, enterprises with general public, enterprise with enterprise, enterprise with market, so as to reach the goal of maintaining well-balanced market economic order.

EES-related intermediary agencies mainly include trade associations, enterprise alliances, certification institutions, accreditation institutions, inspection and testing agencies, examination agencies, consultancy agencies, protection institutions for consumers' rights and interests, and media etc., of which the main functions are to, according to laws and regulations and in terms of technical standards, conduct market-oriented acts such as certification, accreditation, examination and consultancy and services thereof, as well as assist enterprise to implement standards and carry out social monitoring on enterprises' implementation of standards.

① Energy conservation centers

Energy conservation centers in various places of China generally were set up in 1980s. Their main responsibilities are to provide governments with references decision-making in relation to energy conservation, reduction of environment pollution, and strengthening of macroscopic readjustment and control; conduct inspection and tests for enterprises and public institutions to reasonably utilize energy; provide new projects and technical modification projects of enterprises and public institutions with consultancy, design and assessment services concerning reasonable utilization of energy; undertake research, development, certification and promotion of new energy conservation technologies and products; and carry out publicity, technical training and advertisement services so as to enhance public consciousness of energy conservation and environment protection. Therefore, it can be predicted that, along with establishment and perfection of EES implementation and supervision mechanism in China, energy conservation centers will have a more important roles to play.

② Trade associations

Trade association is a communal organization set up by economic agents of special units with common, similar or close market positions, to define and promote common interests of these units⁽¹⁸⁾. Active associations in the sector of energy conservation include China Household Electrical Appliances Association and China Association of Lighting Industry etc. their main tasks are: provide services for development of the trade; maintain healthy order of competition among the trade; on behalf of interests of members, report enterprises' opinions and requirements to government, being a bridge between enterprises and governmental departments; coordinate interests of the trade, protect legal rights and interests of members as well as over interests of the trade; and offer proposals to government for formulations of trade plans, policies and legislation. For proposals concerning functions of trade associations please refer to Section 4 of this Chapter.

③ Certification agencies

Certification is an act conducted by certification agencies to certify a product, service or management system conforms with relevant technical specifications and mandatory requirements thereof, or to assess conformity of standards. In China, certification agencies undertake two

categories of certification: mandatory certification and voluntary certification, such as mandatory 3C product certification and voluntary energy conservation product certification.

④ Inspection and testing agencies

Inspection and testing agencies in our country include state-level inspection centers, and inspection and testing centers under local quality technical supervision institutions. For example, the National Lighting Test Center (Beijing) and the National Lighting Test Center (Shanghai), are state-level professional lighting testing centers authorized by the former National Bureau of Technical Supervision. Product quality inspection institutions undertaking national supervision and inspection work must possess necessary testing conditions and competence, comply with legal requirements, be authorized by AQSIQ, before conduct product quality inspection. National supervision and sampling inspection are usually committed to state-level or provincial product quality inspection institutions established and authorized according to law; product quality inspection institutions accredited by national laboratories will be selected with priority.

International experience show that, all inspections, being inspections of energy efficiency that manufacturers self-declared, inspections and tests supervised by government, or inspections by a third party laboratory authorized by trade associations or consumers' associations, should be conducted by inspection and testing centers. In order to guarantee consistency and authority of tests' results, Australia utilizes laboratories through out the country as well as international laboratories (such as Korean laboratories) to conduct cycle tests. EU requires laboratories to comply with ISO/IEC 17025 and ISO Guide 43 or other standards with equivalent efficacy, and also setup requirements for accuracy and variability of test results and testing methods⁽⁹⁾.

Results of an assessment study conducted by CHEAA, EF and American Council for an Energy Efficient Economy (ACEEE) show that, for improvement of implementation and mandatory implementation of standards, the surveyed suggests strengthen publicity, implementation and training of EES for inspection institutions so as to increase their technical inspection ability.

Therefore, we suggest inspection and testing centers in our country make efforts to improve their own inspection capability; while on the hand, make agreement with other inspection centers on testing methods and procedures of product energy efficiency, to improve accuracy and credibility of tests results.

⑤ Consumers' associations

China Consumers' Association (CCA), approved by the State Council, was inaugurated in December 1984, being a nationwide social organization to protect consumers' interests by means of social monitoring of commodities and services. There are 3138 consumers' associations at or above county's level in China so far, among which 31 are of provinces, autonomous regions and municipalities directly under the Central Government. All kinds of grass-roots network organizations, such as branches in villages, small towns and urban districts, supervision stations and contact stations in village committees, neighborhood committees, trade administrations, universities and colleges, and industrial and mining enterprises have amounted to 156,000; and

more than 100,000 compulsory supervisors and volunteers are working for the safeguard of consumers' rights. According to the “Law of the People's Republic of China on the Protection of the Rights and Interests of Consumers”, CCA and local consumers' associations under at various levels perform the seven functions listed below:

- to provide consumers with information and consultant services;
- to participate in supervision and inspection of commodities and services together with relevant administrative government departments;
- to report, consult and make advice to relevant administrative departments on affairs of consumers' interests
- to receive, investigate and mediate the complaints of consumers;
- to require appraisal department to appraise the quality of commodities and/or services in case the complaint refers to the quality of commodities and/or services. The appraisal department is responsible to notify the result;
- to support the infringed consumers in making lawsuits on violations of consumers' interests;
- to expose and criticize the activities of violating consumers' interests by means of mass-media.

In terms of EES implementation and supervision, the UK Consumers' Association is a strong force. Supervision by consumers' associations is fulfilled via two ways: one is that consumers and consumers' associations complaint to responsible government institutions, which, after receiving a complain, will punish the enterprise concerned by a fine ranging from 100,000 to 1,000,000 pounds, if it is determined by legal procedures (proceedings) that the enterprise provided false labels; the other one is that consumers' associations conduct supervision of products in their respective market, commit a third party laboratory to inspect, and publish the tests results on influential magazines ⁽⁹⁾.

Consumers' associations in China have developed for over 20 years, with established nationwide network. Take the “315 Consumer Rights Protection Day” for example, this annual activity exposes fake and sham products on TV, with wide influence, and shock effects on manufacturers of fake and sham products. Therefore, we suggest making full use the existing network of consumers' associations to enforce its supervision function for EES implementation.

3. Implementation measures

(1) Mandatory certification and accreditation

The certification and accreditation system is an important component of technical standards implementation system. For an enterprise, the most serious punishment is to be derived of market. And the combination of certification system and market access will have strong incentive influence on standardization activities of enterprises. Therefore, active development and

regulation of various mandatory and voluntary certifications is, as it were, the most important and most effective means to drive implementation of technical standards.

Information itself is also a kind of product, though a special one. Only under government's administration, can it be converted into product. The certification and accreditation is major form to convert product information into marketable product.

A complete certification and accreditation system should have such features: objective, independent, transparent, impartial, honest and reputed market; unified supervision and common implementation; shared and full utilized information; a good operation mechanism of certification system serving industry development; a management mechanism organically combining technical laws and regulations with standards; a strong and complete certification supervision mechanism; a certification market of fair and ordered competition; balanced inter-region and inter-trade development; high trade self-discipline.

Certification has two categories, mandatory certification and voluntary certification. Mandatory certification, aiming at products concerning national security, protection from fraudulent activities, human health and safety, lives and health of animal and plant, and environment protection etc., requires uniform product catalogue, uniform certification procedures, uniform marks, uniform charging standards, specified certification agencies, and uniform technical laws, regulations and adopted national standards. Any product listed in the catalogue of mandatory product certification shall be certified for conformity by certification agencies appointed by the government, to obtain relevant certificates and apply certification marks, before leaving factory for sales, being imported, or used during business operations.

Since May 1, 2003, mandatory product certification system—"3C" certification has been implemented in China on 132 product types of 19 categories including wire, cable, circuit switch, and motor vehicle etc. Products without "3C" certification are forbidden to be sold on market, and only products bearing the marks are conforming products

At present, there is no mandatory certification concerning energy efficiency (or elimination scheme for high energy consuming products) in China. Since energy efficiency standards of China stipulate the limited values of energy efficiency, which serves as a guard for market, China now possess all conditions for the elimination scheme for high energy consuming products. Implementation of this scheme surely will improve the EE structure of energy consuming products and equipment in China, increase the proportion of energy-efficient products and equipment, drive enterprises to upgrade production technology and technique, and then guarantee the balance of energy supply and demand as well as a steady growth of state economy.

In order to avoid duplication of labor, overlapping and duplication of powers and institutions during products certification, and to reduce costs of manufacturers, we suggest learning experience from the mature product certification and supervision systems (3C certification system and production license system), and adopting minimum allowable EE index of related products into the existing product index system. This not only has the advantages of reduced costs and

simplified processes, but also would realize the goal of eliminating high energy consuming products from market by utilizing the mandatory features of existing systems.

(2) The mandatory labeling (mark) system

Identification (labeling) of product is one or more marks to show features and performance of a product, by specify name of manufacture, name of product, place of origin, specifications, components, and other quality status, indices of performance, indices of energy and environment protection, which is provided usually by the manufacturer with the purpose of conveying information to consumers and taking commitment. The mandatory labeling (mark) system is a mandatory information labeling system in relation to products concerning human health, environment protection and energy conservation etc. Main references of the mandatory labeling (mark) system are technical laws and regulations and national standards. In August, 2004, NDRC and AQSIQ officially promulgated the “Management Method of Energy Efficiency Labeling” as the No. 17 decree, which meant that the energy efficiency labeling system was officially established in China. This system belongs to mandatory labeling (mark) system.

As mentioned, the China Energy Labeling system was officially implemented on March 1, 2005, for household refrigerators and room air conditioners. The energy labeling system, with advantages such as less investment and quick effects, is significantly influencing the market of energy consuming products in China, by regulating market, guiding consumers and improving energy efficiency.

At present, many existing EES have classified energy efficiency grades for various products, such as washing machines, fluorescent lamps, ballasts, unitary air conditioners, water chilling packages, and small and medium three-phase asynchronous motors etc, being technical preparations for implementation of energy labeling system. Therefore, we suggest enlarging the application scope of energy labeling system, i.e. applying it to more products. We should, in accordance with implementation, management and supervision modes of the existing “*Management Method of Energy Efficiency Labeling*”, develop enforcement regulations for specific products, in order to enlarge applicability and functions of energy labels.

(3) Government procurement

Government procurement is acts of all levels of state agencies, public utilities and incorporations using financial funds to purchase goods, projects and services. Government procurement, by implementation of standards, has the “market polymerization” effect of guiding and readjusting direction of industry development and industry structure. Both the government procurement and government’s instruction are typical external administration acts, and are key means to promote implementation of technical standards.

In the government procurement system, government itself takes the lead as demonstration in introducing technical regulations, or voluntary national standards and association standards; giving prominence to status of technical standards in procurement; purchasing products meeting advanced standards; and promoting effective implementation of standards. Government

procurement will pull increase of demands for products meeting relevant standards, and guide the society and market. What is more important is that it can enhance applicability of adopted voluntary standards and enlarge influences of standards.

The system of government procurement of energy conservation products has been implemented since 2004. Specific suggestions are: to combine the system with energy labeling system and energy conservation product certification, and in future to combine it with voluntary agreement between enterprise and government, by, for example, adding products meeting target EE indices into the list of government procurement, enlarging product scope of government procurement, and promoting enterprises to manufacture more energy-efficient products, which will also help products enlarging their market shares.

(4) The system of quality supervision and sampling inspection

The “*Management Method of National Supervision and Sampling inspection of Products Quality*” explicitly stipulates that the AQSIQ shall be responsible for organizing and implementing national supervision and sampling inspection, and publishes circular of national supervision and sampling inspection; quality technical supervision department of all provinces, autonomous regions and municipalities directly under the Central Government shall undertake any work in relation to national supervision and sampling inspection in the respective administrative areas, according to requirements of AQSIQ. Besides, AQSIQ shall be responsible for formulating the “*List of Major Products Subjected to National Supervision and Sampling inspection*”; and shall conduct revision and modification according to status of product development and change in quality change. Products subjected to national supervision and sampling inspection mainly include products concerning human health, personal and property safety, industry products essential to the national economy and the people's livelihood, and products having quality defects according to users, consumers and related organizations.

The circular of supervision and sampling inspection of the 4th quarter, 2005 shows that, during inspections on household refrigerators, EE indices have already been listed into the scope of national supervision and sampling inspection. At present, China has promulgated over 20 EES in relation to more than 20 products; meanwhile, inspections of energy efficiency have rather high requirement for laboratories, equipment and personnel, and the cost of inspection is quite high. We, therefore, suggest applying EE indices to more sampling inspections of products, and making overall plans and reasonable arrangements, in order to obtain better results with reduced cost.

We may also consult experience of other countries to broaden our views. For example, the supervision and inspection by a third party institution authorized by government is also a model of government supervision, on which the USA has abundant successful experience (see the section of International Experience) that we may learn.

(5) Strengthening implementation of energy conservation product certification

The China Certification Center for Energy Conservation Product (now the China Standard Certification Center, CSC) is a third-party certification agency, organized and led by the former

State Economy & Trade Commission, and approved and established by the former National Bureau of Technical Supervision in October, 1998, for organizing, managing and implementing energy conservation product certification, which has definite legal status and was accredited by national accreditation and certification institutions in August, 1999.

CSC issues a certificate and/or agrees the use of certification mark, to express that an organization has passed certification. Currently, there are certifications for such products as energy conservation products, water conservation products, environment protection products, and 3C certification.

The implementation of voluntary certification of energy conservation products should be strengthened, by cooperation with government procurement system, combination with the “List of Energy Conservation Products for Government Procurement”, and assistance of relevant incentive measures, publicity and education. Based on the already implemented certification of energy conservation products, we should enlarge the scope of certification, explore to set up an international mutual-recognition system for certified products, and improve popularity and public recognition of certified products.

(6) Voluntary agreement

Voluntary agreement is a new management mode and operation mechanism adopted by many countries currently to promote energy conservation, improve energy efficiency, increase enterprises' competitiveness, protect environment and reduce emission of greenhouse gases. Voluntary agreement means an agreement reached by a whole trade or an individual enterprise on the basis of voluntarism with government for certain purposes (environment protection, and energy conservation etc.). The main concept of voluntary agreement is to make more use of, led by government, enthusiasm of a trade or an enterprise for the specified purposes. It is signed by government and production sector driven by respective interests, and can be deemed as social obligations “voluntarily” undertaken by enterprises beyond laws and regulations. The implementation references of voluntary agreements mainly are association standards and target national standards.

The EU has plenty of successful experience in this respect. The EU has negotiated and reached voluntary agreements with the European Committee of Manufacturers of Domestic Equipment (CECED) and the European Association of Consumer Electronics Manufacturers (EACEM). And energy efficiency of 7 categories of products has been improved, with more products agreements under negotiations. The key point is that, an overall target of average reduction of energy consumption is set, instead of respective mandatory minimum standard for single product. For example, the washing machine agreement of 1997, set a goal of reducing 20% of energy consumption. Due to wide supports from manufactures, this goal has already been attained⁽²⁰⁾.

According to data, China since 2002 has conducted experiments of voluntary agreements on the two enterprises of Shandong province, Jinan Iron & Steel Group Corporation (Jigang Group), and Laiwu Iron & Steel Group Corporation (Laigang Group). These two enterprises took commitment

to reach the target of saving 300,000 tons of standard coal within 3 years. In June, 2004, the Environment and Resources Department of NDRC organized the Appraisal Team for Shandong Province Voluntary Agreement on Energy Conservation made of domestic experts on energy conservation policy, technology, economy and audit, to appraise status in 2003 of the experiments of voluntary agreement on energy conservation in Shandong Province. Results of the appraisal show that Jigang Group saved 186,900 tons of standard coal with the value of energy saved being 1,027,900,000 Yuan, which were 111,900 tons and 61,540,000 Yuan higher than indices of the agreement respectively; and reduced sulfur dioxide emission by 3360 tons, and carbon dioxide emission by 112,140 tons of coal equivalent. Laigang Group in 2003 saved 37,000 tons of standard coal with the value of energy saved being 20,000,000 Yuan, which were 17,000 tons and 9,000,000 Yuan higher than indices of the agreement respectively; reduced sulfur dioxide emission by 662 tons, and carbon dioxide emission by 22,200 tons of coal equivalent.

The above data show that voluntary agreements have had significant influence on these two steel enterprises, and achieved good results. Therefore, we can draw lessons from experience of the EU, as well as experiment achievements of our own, to generalize voluntary agreement as a measure for EES implementation.

For example, select areas having preconditions and enthusiasms such as Beijing and Shanghai for experiments, trying to implement in advance the target EE indices of EES through voluntary agreement between government and enterprises. Enterprises manufacture energy-efficient products, while government prepares relevant policies, supporting supervision measures and incentive mechanisms.

(7) Enterprise self-declaration and obligation contract

Such methods as enterprise self-declaration and contract are effective measures to promote enterprise's implementation of technical standards via functions and forces of market. The enterprise self-declaration and contract should be generalized though defining their legal status by relevant laws and regulations. The references of the enterprise self-declaration and contract mainly are association standards and enterprise standards.

As for energy conservation, the contracted energy management generally adopted by some western developed countries is a new energy conservation mechanism based on market: a specialized energy management company, after signing energy service contract with customers, provides customers with a package of services including energy conservation projects, diagnosis of energy system and feasibility study of energy conservation project; helps financing programs; conducts project design, purchase of raw materials and equipment, installation and commissioning, acceptance of project, monitoring on amounts of energy saved, system operating maintenance, project management, and training programs for operators, etc.

In 1996, World Bank, Global Environment Facility (GEF) and China government start the implementation of the significant internal cooperation program—the “WB/GEF China Energy Conservation Promotion Project”, to demonstrate and promote the “contracted energy

management”, promote transition of energy conservation mechanism of China, save energy, improve utilization efficiency of energy, reduce greenhouse gases emission, and protect regional and global environment. During Phase I, three energy management companies (EMCo) have been established in Beijing City, Liaoning Province and Shandong Province as demonstrations, and the Energy Conservation Information Dissemination Center has also been set up. By March, 2004, the total investment for energy conservation modification of these three 3 demonstration EMCo has amounted to RMB 0.71 billion, and the total number of implemented projects of energy conservation modification was over 296, with the average payback period being less than 3 years and IRR of most projects being over 30%. The Phase II of the program will further promote the “contracted energy management”, realize the industrialization of EMCo, and have established EMCo association. Therefore EMCo, a new force of energy conservation, will have a great role to play during the cause of energy conservation of China.

(8) Adoption of incentive measures

International experience proves that incentive measure is a very effective means for policy implementation. Therefore, drawing lessons from successful international experience, we may adopt incentive measures for promoting energy-efficient products. Such measures include: technical bidding invitation, preferential income tax for manufacturers of energy-efficient products, subsidies for consumers buying energy-efficient products, and recognition scheme, etc.

(9) Strengthening publicity and education

For this issue, our country has tried successfully, such as the “GEF Efficient Refrigerator Project” organized by UNDP, State of Environmental Protection Administration of China, CHEAA, some design training programs and technical instructions provided to compressor manufacturers and refrigerator manufacturers, award programs for manufacturers of energy-efficient refrigerators, and measures encouraging dealers to sell energy-efficient refrigerators, etc. A recent survey by CHEEA and relevant media shows that in 2005, both the number of types and proportion of energy-efficient refrigerators in market have considerably increased 60%, compared with the status before implementation of the project.

Therefore, to strengthen publicity and education, it is necessary to: firstly, transform concepts at leader-level, increase the consciousness of information service, and timely provide the general public and enterprises with regulations, policies and standards promulgated by government via various ways including internet, magazines and brochures; secondly, change service modes, perfect information system, and make full use of modern information instruments to provide enterprises of all ownerships with advanced information about management and technologies, which will also significantly reduce cost of social management; thirdly, strengthen education work, improve the general public’s consciousness of energy conservation, resource and environment protection, and popularize energy conservation knowledge into every person and infuse energy efficiency consciousness into every corner of the society.

4. Establishment of social monitoring mechanism

International experience indicates, implementation and supervision of EES is a systematic project, which requires, in addition to government's strong promotion, a social monitoring mechanism through cooperation of governments, enterprises and consumers, so as to build up a complete operation system. So at present, there are cries for the establishment of social monitoring mechanism in China.

On the seminar of implementation anniversary of energy labeling, of which the theme is "Energy Efficiency for Economical Society", the authorized energy labeling management institution (CNIS) put forward the concept of "Energy Labeling Alliance", and handed out near 30 copies of a questionnaire to representatives of government agencies, trade associations, enterprises and media, with 15 feedbacks. The opinions are concentrated on:

1) Implementation of energy efficiency labeling in China is of great significance and has apparent achievements. But the present supervision force is not strong enough, and many products' labeling information does not conform with the actual properties, which has seriously disturbed the market order and requires to be regulated. However, one year's practice proved that, the supervision and inspection conducted only by government is not sufficient, and there is urgent need to establish and regulate a social monitoring mechanism. Only the combination of government power and social power can guarantee effective implementation of energy labeling system.

2) The concept of "Energy Labeling Alliance" is initiative and feasible. A great majority of enterprises expressed enthusiasm for mutual supervision, and have already conducted mutual supervision though there is no overall arrangement at present. Provided with a unified plan for all related works to regulate mutual supervisions among enterprises, the self-discipline system of respective trade would have even better effectiveness. Speaking of this, the proposal of "Energy Labeling Alliance" is a bottom-to-top and spontaneous will of enterprises, and we hope the implementation process can be accelerated.

3) Although the plan to establish an "Energy Labeling Alliance" is feasible, detailed establishment mode and operation scheme still need to be studied by related departments and enterprises

Fig.4-1 shows that the energy labeling system is an implementation measure for EES. Therefore, to summarize, specific policy suggestions are given below:

(1) To guide self-discipline of enterprises

Honesty and integrity is lifeline of enterprises, and basis on which enterprises survive and develop. Under current conditions, the implementation of EES depends on self-conscious acts of enterprises; and EES is implemented via the mode of enterprise self-declaration. Therefore, the enterprise self-discipline is a component of the overall social monitoring mechanism, and a very important one. We may introduce the voluntary enterprise-government agreement and relevant incentive measures, to promote development of energy conservation technology, and to lead enterprises to manufacture more efficient products, in order to reach the target of saving energy and protecting environment.

(2) To enforce functions of trade associations and/or enterprises alliance

In developed market-economy countries, trade associations or enterprises alliances are playing an important role during implementation of EES, such as the Gas Appliance Manufacturers Association (GAMA) and the Association of Home Appliance Manufacturers (AHAM) of USA, and the European Committee for Domestic Equipment Manufacturers (CECED) of EU, etc. Enterprises alliance can supervise implementation of EES, by such methods as accepting and hearing complaints of competitors, committing a third party to inspect and examine products, and publishing catalogue of products etc. (see the appendix of International Experience.) Therefore, the key point of next step is to, by studying the establishment and operation modes as well as management experience of trade associations or enterprises alliances in developed countries, and thoroughly researching on the actual conditions of China, put forward as soon as possible practical and feasible plans, which suit our national conditions, for the establishment and implementation of alliance.

(3) To conduct inspections by third-party institutions

We may also consult experience of other countries to broaden our views. For example, the supervision and inspection by a third party institution authorized by government is also a model of government supervision, on which USA has abundant successful experience (see the appendix of International Experience) that we may learn.

Authorized third-party institutions are responsible for designing, organizing and managing inspection and examination projects of products' energy efficiency. Theirs tasks include: prepare sampling method, take samples of marketed energy-consuming products, send to inspection centers, test energy efficiency of products, and publish test results via various means; keep record of EE test reports of manufacturers' products, and supervise and inspect whether manufacturers meeting requirements of EES (labeling) or not; utilize all kinds of incentive mechanisms to reward the good and fine the bad; spread information; be a bridge of communication between governments and enterprises.

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Appendix

Enforcement and Compliance of Efficiency Labels and Minimum Energy Efficiency Standards for Household Appliances

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1.0 INTRODUCTION

Minimum energy efficiency standards (MEPS) and energy efficiency labels for domestic appliances and lighting products have been widely accepted as a cost-effective tool in reducing appliance energy consumption and related environmental emissions. Over 40 countries have adopted such policies around the world (CLASP). The covered products range from white goods, home electronics, office products, to a variety of lighting equipment (CLASPOne.org)ⁱ.

However, the effectiveness of MEPS and labeling programs depends on the extent they are enforced. While some countries have developed detailed monitoring and enforcement regulations such as US, Canada, and Japan, others only have limited enforcement mechanisms for ensuring compliance to standards and labeling requirement. In this paper we will survey the literature on enforcement regulations around the world, and shed light on key elements of successful enforcement programs.

2.0 FRAMEWORK FOR ENFORCING ENERGY EFFICIENCY STANDARDS AND LABELS

A well-developed enforcement framework is essential to the effectiveness of efficiency standards and labeling programs. Without effective enforcement, it would be 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 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 responses to non-compliance,
- 6) Establish sufficient penalties and adequate administrative processes,
- 7) Develop 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.

A good testing protocol should reflect common usage pattern of the products, and need 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 would facilitate the harmonization of standards between economies and promote trade in domestic appliances, since most economies require appliances to be certified in some fashion before being sold in their jurisdictions.¹

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 such as the California Energy Commission (CEC) and AQSIQ in China. 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 process. 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 could be done by government laboratories 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 is afforded a chance to dispute the charge of non-compliance though 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

¹ 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.

include private warning/dialogue, public notification, ordering change, fines, and elimination of the offending products from the market place.

3.0 ENFORCEMENT EXPERIENCE AROUND THE WORLD

While over 40 regions that have adopted some forms of minimum energy performance standards and labels for household appliances, only few have well documented enforcement procedures. This review is therefore limited to the extent that we could find documented case studies. Nevertheless, the examples presented below offer valuable insight on the development of an effective enforcement system.

4.0 UNITED STATES

4.1 Overview of MEPS and Labels in the United States

In the United States, there is a mandatory energy efficiency standard program, a mandatory energy information labeling program, and a voluntary energy labeling program. The Department of Energy (DOE) 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, Energy Guide; and the Environmental Protection Agency (EPA), together with DOE, manages the development and enforcement of the voluntary labeling program, the Energy Star. Given that the Energy Star is a voluntary program, the review on enforcement will focus mostly on the first two programs.

DOE and FTC often work together in the enforcement of labels and MEPS. They both use the DOE test procedures. However, the product ranges covered under these two programs are somewhat different: FTC does not require labels for all of the DOE appliances. Labels and MEPS can be further broken down into residential and commercial/industrial appliances, lighting and equipment.

The earliest federal legislation on MEPS and labeling was enacted in 1975 with the Energy Policy and Conservation Act (EPCA). Since then additional legislation has built upon earlier legislation with the National Energy Conservation Policy Act of 1978 (NECPA) and the National Appliance Energy Conservation Act (NAECA) of 1987. Additional amendments were added to EPCA in 1988 (National Appliance Energy Conservation Act 1988) and in 1992 (Energy Policy Act, EPACT 1992). The most recent legislation was the Energy Policy and Conservation Act of 2005 (EPACT 2005) which prescribed standards for additional products. Some products are authorized for standards have not been through the rulemaking process.

4.1.1 Residential Products

The residential appliances that have MEPS are listed below, in Table 1.

Table 1: Residential appliances covered under MEPS and Energy Guide in US

Products	MEPS	Energy Guide
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<i>Clothes washers</i>	Yes	Yes
<i>Clothes dryers</i>	Yes	No
<i>Dishwashers</i>	Yes	Yes
<i>Furnaces and boilers</i>	Yes	Yes
<i>Direct heating equipment</i>	Yes	No
<i>Central air conditioners and heat pumps</i>	Yes	Yes
<i>Room air conditioners</i>	Yes	Yes
<i>Water heaters</i>	Yes	Yes
<i>Refrigerators & freezers</i>	Yes	Yes
<i>Kitchen ranges and ovens (no label)</i>	Yes	No

As new product standards are added by either new legislation or by scheduled updates to existing regulations; it is necessary to reference regulatory web sites to keep up-to-date with the most current regulations. The current schedule for rulemaking changes can be found at the DOE web site, http://www.eere.energy.gov/buildings/appliance_standards/2006_schedule_setting.html, and the report to congress, http://www.eere.energy.gov/buildings/appliance_standards/pdfs/congressional_report_013106.pdf. In some cases the DOE is mandated to promulgate new standards and in other cases it is authorized to enact new standards at their discretion.

4.1.2 Commercial/Industrial Products

MEPS of commercial and industrial products are legislated in the Energy Policy Act of 1992 (EPACT 1992). These products include:

- ballasts,
- lamps,
- air conditioners,
- distribution transformers, and
- motors.

While rules regarding compliance and enforcement are similar, testing for lamps shall be conducted by test laboratories accredited by the National Voluntary laboratory Accreditation Program (NVLAP) or by an accrediting organization recognized by NVLAP. Motors are to be tested in a DOE recognized national certification program or in an accredited laboratory meeting DOE requirements (10 CFR 431.17, 2005).

4.1.3 Where to Find Regulations

Regulations are issued by executive branch agencies to carry out federal laws, such as the standards laws, and are available in the Code of Federal Regulations. For the regulations pertaining to appliance and equipment standards, see Title 10, Chapter II, Part 430—Energy Conservation Program for Consumer Products and Title 10, Chapter II, Part 431—Energy Efficiency Program for Certain Commercial and Industrial Equipment (US Congress?).

Appliance labeling regulations can be found in Title 16, Chapter I, Part 305 – Rule Concerning Disclosures Regarding Energy Consumption and Water Use of Certain

Home Appliances and Other Products Required Under the Energy Policy and Conservation Act --“Appliance Labeling Rule (FTC, 2006).

The Code of Federal Regulations is updated with the most current regulations once a year. For more frequent updates of information, the Federal Register publishes new regulations on a daily basis.

4.2 Reporting Requirements and Enforcement Principles

Self-reported Data To FTC and DOE

In the USA, the DOE and FTC rely on *self-enforcement*. Manufacturers typically test their own products and report data on efficiency to the FTC and the 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 the FTC or DOE if a competitor is not in compliance. In fact, anyone can report product non-compliance to the DOE. The DOE will evaluate the report to see if it has merit. Typically, this would require some evidence obtained by testing.

Using a Trade Association

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 the manufacturers to test their competitors products to ensure their accurate reporting of test results. Manufacturers typically also run their own tests and continually compare them to the results obtained by the trade association.

The manufacturer may also authorize, i.e., sign an agreement with the trade association, to have them report efficiency data to the FTC and the DOE, to simplify paperwork requirements. Alternately, the manufacturer may participate in the trade association program but report compliance information to the FTC and DOE themselves. Alternately a manufacturer may hire an independent test laboratory and report the test results to the DOE and FTC. No matter who does the testing, the manufacturer is ultimately responsible for the test results.

4.2.1 Trade Associations

The trade associations with directories and verification programs include: the American Refrigeration Institute (ARI), the Association of Home Appliance Manufactures (AHAM), and the Gas Appliance Manufacturers Association (GAMA).

ARI’s directory covers central air conditioners and many other products not currently regulated for MEPS in the USA

AHAM’s directory covers room air conditioners (capacity and efficiency) and dehumidifiers.

GAMA's directory covers a range of gas-using appliances such as water heaters, furnaces, and boilers.

ARI, AHAM, and GAMA all use a third party test laboratory (ITS)² to test products for their verification programs.

Each trade association has its own procedures for running a directory/check test program. These details are discussed below. Complete details are available on their respective web sites provided in the reference section.

4.2.1.1 ARI -- Air Conditioning and Refrigeration Institute

Background

ARI is accredited, according to ISO Guide 65, as a certification body. In addition, ARI has mutual recognition agreements with other certification bodies, thereby facilitating the movement of products across borders without the need for additional testing. Certification is open to all manufacturers including international and non-ARI members. The participation fee is different for each program (i.e., product). The program participant is charged according to the number or value of products they ship. The manufacturer must report monthly shipments to ARI. It takes from two to six months to qualify and be admitted into a certification program. If you want to participate in the program all of your products within a category must participate. It is not allowed for the manufacturer to pick and choose which model numbers (within a product category) they want in the program. The largest product program is the unitary air-conditioner & heat pump equipment, which runs an average of about 1000 tests per year.

Procedures and Rules of Operation

ARI selects the model to be tested according to their selection criteria. A random sample of products is tested annually. Typically 30% of the basic model families are tested. The laboratory representative selects the unit to be tested from the participants' production lines or from the stock held by the participants, private brand manufacturers, dealers, or distributors. The laboratory representative then arranges for the unit to be delivered to the laboratory.

After the samples are collected they are sealed such that they cannot be tampered with before they are shipped to the test laboratory. They are then transported to the test laboratory where the testing begins. Manufacturers are not permitted to be present in the test room when their unit is being tested.

If a test fails, the laboratory will contact the manufacturer and report the nature of the failure and the pertinent test data. The manufacturer can choose to re-rate the product model or have a second unit tested. If the second unit passes, no new ratings are required. If there are continued violations, ARI will impose penalties on the participant and the listing may be withdrawn. Penalties include additional required testing and monetary penalties that vary with the number of

² Intertek Testing Services – www.intertek-etlsemko.com

models that need to be rerated and the type of equipment. Assessment of penalties are detailed in the ARI certification program operational manual.

Challenge Testing

A participant in the program may challenge another participant's results. The challenger must report test data showing the reason for the challenge. The basic requirement is that the sample tested shall show a performance within the tolerance established in the Standard. In the event of a failure on the first sample, the challenged party may elect to de-rate the model, or to request a test of a second sample. If the challenge is valid, i.e., the unit fails the test, the offending manufacturer must pay the cost of testing, otherwise the challenger pays. If a second test is run, the manufacturer (challenged party) pays, regardless of whether or not the second sample passes.

The results of a challenge test shall be used in the determination of an individual participant's annual testing and penalties requirements. The challenge test results shall not be used for the determination of the overall program test results.

Product Listings

A list of certified products can be found at www.ariprinenet.org. The certification list is continuously updated.

4.2.1.2 AHAM – Association of Home Appliance Manufacturers

Background

AHAM conducts a voluntary certification program for the currently regulated room air conditioners and for dehumidifiers which will have MEPS in the future. In past years, it conducted a refrigerator volume certification program, but this has been discontinued. AHAM retains ITS as its third party test laboratory.

Procedures and Rules of Operation

For its room air conditioner certification program, 50% of a manufacturer's new models, and 10% of the model numbers from a previous year are tested. Overall, approximately 25% of each manufacturer's models are tested. The manufacturer does not know in advance which models will be tested or when they will be tested. At least one additional unit is tested of any model whose production during a program year exceeds 20,000 units.

If a manufacturer has incorrectly rated a model's EER or capacity; the manufacturer must inform dealers of the new rating, it must put new labels on the product, and the new ratings are noted in the AHAM Directory. Any participant who does not comply with the above, can no longer take part in the certification program.

Challenge Testing

AHAM has a provision for challenging the ITS test results that is similar to the ARI procedure.

Product Listings

AHAM publishes directories on its web site www.aham.org.

4.2.1.3 GAMA – Gas Appliance Manufacturers Association

Background

GAMA uses ITS as its independent testing laboratory. The fee to participate in the certification program is based on the participant's previous month's shipments.

Procedures and Rules of Operation

Two types of testing are done: random testing and complaint testing. For the case of standard program testing, models are chosen for testing by the GAMA program administrator at random. At least one unit of the models chosen are tested. The total number of units tested for each manufacturer is calculated based on a mathematical combination of the participant's number of basic listed models and their relative size in the market. Only ITS personnel shall be permitted to physically install and check out test units.

What is considered to be in compliance with the check test program depends on the product being tested. For furnace testing, the test results must be greater than or equal to 95% of both the certified AFUE and Heating Capacity. For residential water heaters the acceptance criteria requires that test results must be greater than or equal to both 96.5% of the certified EF and 90% of the certified first hour rating. For commercial water heaters the acceptance criteria require the thermal efficiency test results to be greater than or equal to 98% of the certified thermal efficiency. Standby loss test results must be less than or equal to 100% of the certified standby loss.

Challenge Testing

GAMA has a provision for challenging the ITS test results similar to the AHAM and ARI methods.

Product Listings

Certified products are published on the GAMA web site www.gamanet.org.

4.3 Federal Trade Commission (FTC) – the Energy Guide Label

Title 16, Part 305 of the Code of Federal Regulations (CFR) covers the rule concerning disclosures regarding energy consumption and water use of certain home appliances and other products required under the Energy Policy and Conservation Act. The authority for this regulation is 42 U.S.C. 6294 and is given in 52 FR 46894 (FTC, 1987).

This CFR includes information on testing and required disclosures. A few of the important topics are listed below. The enforcement penalties listed in the Act are allowed to be adjusted for inflation.

4.3.1 Penalty Section of CFR

Under threat of penalty for not compliance, the manufacturer must:

- have a label as specified in the regulations on the appliance
- can not remove the label
- provide access of records to the FTC

- report information the FTC as required
- allow inspection and allow the FTC to observe testing
- supply two units to any laboratory designated by the FTC for purposes of testing
- provide label information in catalogs
- base any advertising claims for energy and water use on the test procedure specified in the regulation

4.3.2 Submission of Data

All data must be reported to the FTC by or before the date listed in the regulations. This date varies depending on the product. Data on new models must be submitted to the FTC before the product is put into commerce.

4.3.3 Test Data

The manufacturer must keep test data on file and shall provide these to the FTC upon request, within 30 days of such a request. The manufacturer must supply no more of two of each model to a laboratory of FTC's choice, at the manufacturer's expense, for testing. This procedure takes place only after the manufacturer's test results have been examined and after the manufacturer has been allowed to reverify its test results.

4.3.4 Sampling

Any energy use representation shall be based on sampling procedures in section 430.24 of 10 CFR part 430, subpart B, except for medium base compact fluorescent lamp or general service incandescent lamp which "shall be based upon tests using a competent and reliable scientific sampling procedure".

4.3.5 Enforcement and Penalties

Retailers not displaying the required energy efficiency label may be fined up to \$110 for each label that is removed or rendered illegible. In addition to the label, manufacturers must comply with DOE testing and certification requirements.

When a violation has occurred the FTC may enter into a *consent order* with the company in which the company voluntarily comes into compliance.

If a consent agreement can not be reached the FTC may issue an *administrative complaint*. In this case an administrative judge listens to testimony, evidence is submitted and the judge makes a ruling.

4.3.6 Practical considerations

The FTC does not have a large staff to investigate violations, therefore, they rely on the DOE for technical support. They do, however, conduct inspections to verify if retailers are leaving the efficiency labels attached. They may also investigate complaints that they feel might have merit, indicating that products are mis-labeled, or perhaps showing that they are more efficient than they actually are.

Typically, the retailer or manufacturer in question is given a phone call to let them know they are not in compliance and that they need to rectify the situation. This usually takes care of the problem. If not, the FTC may then take legal action against the entity not in compliance.

4.4 Department of Energy (DOE) – Minimum Energy Performance Standards

MEPS for appliance and lighting products are separated into two sections of the Code of Federal Regulations: 10CFR430ⁱⁱ for residential products and 10CFR431 for commercial and industrial equipmentⁱⁱⁱ. Enforcement for residential products is discussed below, however, provisions for commercial and industrial product enforcement are similar. Residential products include commercial ballasts as they were legislated as part of NAECA which is primarily for residential products. Furthermore, the regulations are divided into requirements for submission of data in order to sell a product in the United States and requirements for enforcement to verify a report of non-compliance.

4.4.1 Submission of data:

Before distributing a product, the manufacturer or private labeler (or its authorized representative such as a trade association) must send a certification report to DOE. They must report discontinued models it no longer manufactures. They must also provide access to their records upon DOE request. The manufacturer must maintain test records and the supporting test data for two years

The manufacturer can provide above information through a third party such as AHAM, ARI or GAMA. For general service fluorescent lamps and incandescent reflector lamps the certification submitted must include the ID number of the NVLAP laboratory. NVLAP is the National Voluntary Laboratory Accreditation Program.

4.4.2 Sampling for Submission of Data

A formula for sampling is provided in the DOE regulations. The number of samples depends on the product.

Central air conditioning is a special case because many different evaporators can be installed with the same compressor. Many of these evaporators are manufactured by a company other than the manufacturer of the condensing unit. To reduce the burden of testing for all possible evaporator coil and condenser combinations, the basic model is tested and other models may be certified on the basis of computer simulation in combination with data. The computer model must be approved by DOE.

Examples of compliance testing requirements

Refrigerators

The daily consumption of the tested units (kWh/day) -- a value for which consumers would value a lower number, should be the higher of:

- a) the mean of the sample, or
- b) the upper 95 percent confidence limit of the true mean divided by 1.10.

The daily consumption number should be no more than the corresponding MEPS value.

Dishwashers

The Energy Factor (EF) of the tested units, a number for which consumers would value a higher number, should be the lower of:

- a) the mean of the sample or
- b) the lower 97 ½ percent confidence limit of the true mean divided by 0.95

This Energy Factor should be no less than the corresponding MEPS value.

Water Heaters

The Energy Factor (EF) of the tested units, a number for which consumers would value a higher number, should be the lower of:

- a) the mean of the sample or
- b) the lower 95 percent confidence limit of the true mean divided by 0.90.

This estimated Energy Factor should be no less than the corresponding MEPS value.

Room air conditioners

The Energy Efficiency Ratio (EER) of the tested units shall be the lower of

- a) the mean of the sample or
- b) the lower 97 ½ percent confidence limit of the true mean divided by 0.95.

And the estimated EER should be no less than the corresponding MEPS value.

Central air conditioners

The Seasonal Energy Efficiency Ratio (SEER) of the tested units shall be the lower of

- a) the mean of the sample or
- b) the lower 90 percent confidence limit of the true mean divided by 0.95.

And the estimated SEER should be no less than the corresponding MEPS value.

The condenser-evaporator coil combination selected for testing shall be to the one with the largest volume of retail sales. Alternative methods using computer simulation fitted to actual performance data may be used if approved by DOE.

Fluorescent lamp ballasts

The test sample should be of sufficient size – no less than four. The tested results should be the lower of:

- a) the mean of the sample or
- b) the lower 99 percent confidence limit of the true mean divided by 0.99.

General service fluorescent lamp and incandescent reflector lamps

Samples shall be averaged for a 12-month period. A minimum sample of 21 lamps is required.

4.4.3 Enforcement

In summary, the U.S. DOE relies on self-enforcement through trade association certification programs. For products not belonging to a certification program, it relies on competitors to report non-compliance. Past history has shown that DOE will work with a manufacturer to achieve compliance and will negotiate a penalty that may be less than the maximum allowed.

General provisions for certification and enforcement are outlined in section 430.61 or 10 CFR, Part 431, subpart G. Upon receiving information in writing which indicates the covered product may not be in compliance, DOE may examine the manufacturer's test data, may meet with the manufacturer to discuss test results or may conduct independent testing of the product in question. The manufacturer must supply a reasonable number of units to a DOE designated test facility, at the manufacturer's cost.

Penalties of up to \$110 are allowed for each violation of non-compliance. A violation means for each product sold for each day of non-compliance. For example, if 1,000 products were on the market for 365 days, the penalty legally allowed could be up to 40.15 million dollars (1,000 x 365 x \$110).

The intent is that the fine is big enough so that manufactures will comply with the regulations and not to put the company out of business. In practice, the actual fine and remedy is typically reduced based on the severity of the violation.

4.4.4 Sampling Plan for Enforcement

While similar to the sampling plan for data submission, there are some small differences. Details can be found in 10CFR Appendix B to Subpart f of part 430.

5.0 CANADA

5.1 Overview of MEPS and Labels in Canada

The basic approach for MEPS enforcement in Canada is to have every product tested by a certified laboratory.

The regulatory agency involved in standards and labeling is Natural Resources Canada (NRCan) Office of Energy Efficiency (OEE). Canada published the Energy Efficiency Act in 1992. The regulations require that all prescribed products meet the minimum energy performance levels.

5.1.2 Where to Find Regulations

In Canada energy efficiency regulations are published in the Canada Gazette Part II.

For the regulations see: <http://www.oee.nrcan.gc.ca/regulations/guide.cfm>.

5.2 Reporting Requirements and Enforcement Principles

Regulated products must bear an energy performance verification mark before the products leave the possession of the dealer. This verification mark indicates that the energy performance of the regulated product has been verified. This mark must be the mark of either a recognized verification agency or a province. The current Regulations state that these certification must be accredited by the Standards Council of Canada (SCC) for electrical and electronic products, fuel-burning equipment, or gas-fired appliances and equipment. The accredited certification body must also be 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.

Under the current Regulations, the eligibility criteria for organizations to engage in energy efficiency verification of regulated products are as follows:

- The accreditation of certification bodies by the SCC; and
- The recognition of SCC-accredited certification bodies by the Minister or NRCan as an administrator of an energy efficiency verification program.

Under newly proposed regulation, NRCan intends to change the eligibility criteria to reflect the following:

- Maintain that certification bodies be accredited by the SCC;
- Add that all certification bodies must be accredited by the SCC for energy efficiency verification. The scope of accreditation of these organizations must specifically reflect energy efficiency verification and
- Remove the requirement for the Minister of NRCan to recognize SCC-accredited certification bodies.

The effective date for all changes will be July 2005.

The following certification organizations are currently accredited by the SCC.

- ARI
- CSA International (CSA)
- Intertek Testing Services NA Inc.
- Intertek Testing Services NA Ltd.
- Underwriters Laboratories Inc. (ULI)

Dealers must adhere to the energy efficiency regulations when a product is shipped from one province where it is manufactured to another province and when a product is shipped into Canada. Fines vary depending on the violation but range from limits of \$CN10,000, \$50,000 to \$200,000 for an indictable offence. When an offence under section 27 is committed on more than one day or is continued for more than one day, it shall be deemed to be a separate offence for each day on which the offence is committed or continued.

5.2.1 Sampling Plan

A good explanation of the sampling plan is presented in Appendix B of CSA standard C656.

6.0 EUROPEAN UNION

6.1 Overview of MEPS and Labels in the European Union

The European Union to date has enacted 3 mandatory minimum efficiency standards:

- Cold appliances (refrigerators, freezers and refrigerator-freezers)
- Gas or liquid-fuel fired hot water boilers, and
- Ballasts for fluorescent lighting.

In addition, four negotiated agreements have been established between industry associations and the European Commission. These are:

- Washing machines
- Dishwashers
- Domestic electric storage water heaters
- TV and VCR and HI-Fi (Audio) standby power loads.

The European Union has issued Directives on labeling for the following appliances:

- Refrigerators, freezers and their combinations;
- Washing machines, dryers and their combinations;
- Dishwashers;
- Ovens;
- Water heaters and hot-water storage appliances;
- Lighting sources;
- Air-conditioning appliances.

All EU implementing directives must be transposed into national law.

6.1.1 Where to Find Regulations

European MEPS and Labels are published in the *Official Journal of the European Union*. The relevant standards are not published in the Directives but in the Official Journal so that they can be more easily updated and changes without changing the Directive which is a more complicated procedure.

6.2 Enforcement of MEPS and Labels

The member states are responsible for enforcement. There is no common enforcement procedure across EU member states. Some countries have extensive verification and enforcement procedures such as Denmark, while others do close to nothing. In Germany the States are legally responsible for enforcement. Enforcement including a legal follow-up to non-compliance is very rare in Europe, however, there have been some legal cases in Denmark, and in the Netherlands (Klinckenberg, 2005).

6.3 Appliance Testing

Testing is done primarily by manufacturers, at in-house or commercial laboratories. No certification is required. Verification testing is done by government laboratories, commercial laboratories working on a government contract or sometimes consumer organizations (Klinckenberg, 2005).

The general rule on the number of appliances to be tested is as follows. First one product is tested and if the performance is within a 15% tolerance of the declared performance, it complies. If not, a second series of three

appliances is tested, and the average must be within a tolerance of 10% of the declared value. The test standard, however, may require that a single “test” consist of a series of tests, as is the case with washing machines where a series of five tests are done and the average of the five tests is the result. An exception to this rule is the testing of household lamps where 20 lamps need to be tested (Klinckenberg, 2005).

6.4 Penalties for non-compliance

This is dependent on national law. Some jurisdiction require the withdrawal of a non-complying product from the market, some impose a fine. Some new member states even can have prison terms for the person responsible for the non-compliance.

Recommendations for administering verification and enforcement regimes for countries entering the EU are detailed in the publication “The Central and Eastern European Countries Appliance Policy Project (CEECAP).

7.0 AUSTRALIA

7.1 Overview of MEPS and Labels in Australia

In Australia energy labeling is made mandatory by the state governments. MEPS programs are made mandatory in Australia by state government legislation and regulations which give force to the relevant Australian Standards. Regulations specify the general requirements for MEPS for appliances, including offences and penalties if a party does not comply with the requirements. Technical requirements for MEPS are set out in the relevant appliance standard, which is referenced in state regulations. State based legislation is necessary because the Australian constitution gives Australian States clear responsibility for resource management issues, including energy.

The National Appliance and Equipment Energy Efficiency Committee, consisting of officials from the Commonwealth, State and Territory government agencies and representatives from New Zealand, is responsible for managing the Australian end-use energy efficiency program. The Committee reports to other government structures and is ultimately directed by the Ministerial Council on Energy which is composed of the Energy Ministers from all jurisdictions (<http://www.energyrating.gov.au/reg.html>)

For additional information see relevant websites of the Australian Office of Greenhouse Gas, <http://www.greenhouse.gov.au/> and <http://www.energyrating.gov.au/meps1.html>.

7.2 Reporting Requirements and Enforcement Principles

The governments have enacted a check-test system, whereby the government contracts with an accredited laboratory to test appliances. Appliances are purchased from retail outlets. Violators are notified and given the opportunity to dispute the finding and have more appliances tested. Failure to comply with labeling and MEPS can result in being deregistered or in other words withdrawing the supplier’s right to sell the appliance. All initial check-tests are funded by government agencies but any subsequent testing to verify or overturn the check-test result is at the supplier’s expense (CLASP, 2006).

7.3 Regulatory Requirements for Energy Labeling and MEPS

State regulations for energy labeling and Minimum Energy Performance Standards (MEPS) typically include a range of provisions and requirements which are summarized below. It should be noted that the exact requirements and penalties for any offences should be checked with the relevant state authority: information provided here is only a guide. Currently, energy labeling applications for an approved energy label are accepted by New South Wales, South Australia, Victoria and Queensland. A registration for energy labeling in any of these states are accepted as valid in all Australian states and territories.

All energy labels must be approved by a regulatory authority: All products within the scope of energy labeling and/or MEPS must be registered. Applications for energy label registration and MEPS compliance should include:

- test reports or data to the relevant standard (the number of units to be tested varies - see particular requirements by product);
- demonstration that the relevant performance requirements have been met by the model in addition to the measurement of energy consumption;
- a sample label (where applicable);
- the product meets the MEPS requirements (where applicable);
- the prescribed fee.

Cancellation of the label or MEPS approval: the regulatory authority can cancel the registration where there are reasonable grounds for doing so.

Offences: The following offences are typically contained in state regulations.

- person must not offer to supply (e.g. sell) a "specified" article which is not registered for energy labeling or MEPS (as applicable), or where the registration has been cancelled;
- energy label must not be obscured;
- other information must not be shown near the label that conflicts with data on the energy label;
- making a false or misleading declaration;
- registration holders must notify the regulatory authority of any change of contact details;
- registration holders must supply a sample for testing on the request of the regulatory authority;

Registration holders may be liable for costs of check testing by the regulatory authority if tests show that the model does not comply.

8.0 OTHER COUNTRIES AND ECONOMIES

Philippines and Tunisia

In the Philippines and in Tunisia every model of the regulated appliances must be tested by a government controlled test before it is allowed on the market. In Tunisia a single unit is tested. If the results are accepted by the manufacturer a label is printed and supplied to the manufacturer.

If the manufacturer does not accept the results, it is entitled to pay for further testing. (CLASP, 2005)

Japan

The “Top-Runner” program in Japan is developed and enforced by METI (Ministry of Economy, Trade and Industry). A target efficiency is set for a particular year for all manufacturers and importers. To verify the compliance of the “Top-Runner” program, the Agency for Natural Resources and Energy under METI conducts surveys to collect information such as sales, energy consumption/efficiency for the target year from manufacturers and importers. Product catalogues are also collected periodically as well to compile such information (METI).

If the weighted average efficiency of a covered product from a manufacturer is found to be lower than the Top Runner requirement, METI would first make a private recommendation to the manufacturer to rectify the situation. If such advice is not followed, the results are made public. Such public announcement would seriously hurt the reputation of the concerned manufacturers, and this threat alone seems to have led to almost universal compliance to the Top Runner Program. If the non-compliant manufacturer still fails to take appropriate corrective actions, penalties (fewer than 1 million yen) or one-year penal servitude could be imposed (Nagata, 2006). However, such penalties were never used so far.

California

In the state of California in the US, appliances not regulated by the Federal Government can be regulated for energy efficiency by the California Energy Commission (CEC).

Testing Requirements (section 1603 of the California Code of Regulations, Title 20)

The manufacturer shall cause the testing of units of each basic model of appliance using the applicable test method listed in the regulations. If the manufacturer of the basic model does not participate in an approved industry certification program for the basic model, or does not apply such a program to test all units, the testing shall be at a laboratory the Executive Director determines meet his requirement, which include maintaining copies of all test reports and allowing the Executive Director to witness any test of an appliance up to once per calendar year for each basic model.

CEC is also mandated to conduct periodical testing. If the tested product meets the California standard but is less efficient than the manufacturer’s claim, CEC will have an informal hearing with the manufacturer to communicate the findings and give the manufacturer a chance to validate its claim or change its rating. If the tested product fails the California standard, the product could be delisted from the official registry. Of course, the manufacturer will be given a chance to rectify the situation first. In almost all cases, the manufacturer has complied (NRDC, 2005).

References:

CLASP, 2005, *Standards and labeling Guidebook, version 2*

CLASP, 2006, www.clasponline.org

APLAC members

http://www.aplac.org/members/members_list.htm

UNITED STATES

Department of Energy

Energy Efficiency and Renewable Energy Network- Office of Codes and Standards

http://www.eere.energy.gov/buildings/appliance_standards/laws_regs.html

Federal Register

http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=browse_usc&docid=Cite:+42USC6303

Code of Federal Regulations

<http://www.gpoaccess.gov/cfr/index.html>

http://www.access.gpo.gov/nara/cfr/waisidx_01/10cfr430_01.html

U.S. Federal Trade Commission

Appliance Labeling rule

<http://www.ftc.gov/bcp/online/edcams/eande/index.html>

Test Laboratory

Intertek, <http://www.intertek-etlsemko.com>

Trade Associations

ARI

www.ari.org

www.ariprimenet.org

AHAM

www.aham.org

GAMA

www.gamanet.org

<http://www.gamanet.org/gama/inforesources.nsf/vAllDocs/Procedures+and+Standards?OpenDocument>

NRDC (Natural Resource Defence Council), 2005 (draft), “Appliance Efficiency Laws in the US and China: Recommendations for Improving the Chinese Law to Promote Compliance and Enhance Government Enforcement Power.”

EUROPE

The Central and Eastern European Countries Appliance Policy Project (CEECAP)

Link to European Directives

http://europa.eu.int/comm/energy/demand/legislation/library_en.htm

Hot water boiler directive

<http://europa.eu.int/scadplus/leg/en/lvb/l21019.htm>

Air conditioner directive

http://europa.eu.int/eur-lex/pri/en/oj/dat/2002/l_086/l_08620020403en00260041.pdf

Frank Klinckenberg, personal communications, 15 September 2005

CEECAP, “The Central and Eastern European Countries Appliance Policy Project (CEECAP)”.

Japan

METI, 2005, “Developing the World’s Best Energy Efficient Appliances (Japan’s “Top Runner” Standard).

ECCJ (the Energy Conservation Center of Japan), www.eccj.or.jp/index_e.html

Nagata Y., 2006, “current Circumstances about Japanese Appliance Energy Efficiency Standards,” paper submitted for the 2006 ACEEE Summer Study on Buildings, Asilomar.

ⁱ <http://www.clasponline.org/main.php>

ⁱⁱ 10CFR Part 430 – *Energy Conservation Program for Consumer Products*

ⁱⁱⁱ 10 CFR Part 431 – *Energy Efficiency program for Certain Commercial and Industrial Equipment.*