A Study of International Appliance Standards Enforcement Strategies

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ABSTRACT

As regulatory agencies around the world become more aggressive with their energy efficiency goals, the use of appliance standards has become one of the important strategies to meet policy targets. Thus, understanding how various entities increase the stringency of regulations on energy performance and labeling of appliances is necessary in improving effectiveness of such standards.

For this study, we researched and collected information from various state, national, and international entities on their requirements for appliance testing, certification, and compliance with specific efficiency standards as a condition of selling their appliances within certain geographic areas. Areas studied include the United States, Australia, Japan, Canada, China, and the European Union. Each jurisdiction/country has its unique set of business environment, consumer awareness of energy efficiency, and regulatory environment. There are two major types of appliance efficiency regulations used in most of the countries around the world – performance standards and product labeling. Within each there are several variations and supporting regulations that enable the implementation and enforcement of these regulations. Requirements can be mandatory (required by law) or voluntary (commitment by industry or negotiated agreement between industry and regulatory agency).

This paper discusses for each entity how manufacturers, distributors, and other sellers are notified of the requirement for appliance testing and certification, proper labeling and marketing of the certified efficiency, and proper withholding of non-complying models from the entity's area of jurisdiction; and to provide a summary of each entity's analysis (if available) of the success or failure of manufacturer and/or distributor cooperation.

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Introduction

Regulatory agencies around the world are getting more aggressive with their energy efficiency goals, and thus increasing the stringency of regulations on energy performance and labeling of appliances. The most commonly used regulatory instrument for all the entities studied for this report are appliance labeling, followed by minimum energy performance standards (MEPS) for appliances. Labeling requirements are

often used as a 'foot in the door' for more stringent performance requirements later on. Each jurisdiction/country has its unique set of business environment, consumer awareness of energy efficiency, and regulatory environment. Below we describe the major types of appliance regulations.

Minimum Energy Performance Standards (MEPS*).* In this type of a regulation, the regulatory entity sets a minimum energy performance threshold for each appliance category that is manufactured or sold in its territory. The minimum performance threshold is based on metrics of energy performance developed through careful analysis of existing market technologies, stakeholder participation and regulatory goals for improvements in energy efficiency.

Product Certification Requirements. Under these regulations, manufacturers are required to certify that the appliance(s) they manufacture, assemble or sell within the jurisdiction of the regulatory agency meets the appliance performance regulations. These certification requirements often work as a subset of and in support of MEPS.

Product Testing and Verification. For products that have MEPS or labeling requirements and where manufacturers are required to certify their products, the regulatory authority often requires testing of products in certified, independent testing laboratories. This is to ensure the accuracy of manufacturer claims, and also to provide a level playing field and common test procedures for all manufacturers' products.

Product Labeling. In this type of a regulation, the manufacturer and retailer is required to attach a label and supporting documentation with each appliance covered by the labeling requirement. This label provides information on the energy efficiency of the appliance. Often, these labels also indicate how the given appliance rates against other appliances in the market, or against some common performance thresholds established by the regulatory entity. Such labeling requirements do not eliminate the manufacturing and sale of the least efficient appliances, but hope to achieve that goal through education of the customers and through the loss of competitive advantage for the manufacturers and retailers of these least efficient appliances. As with MEPS, products that are required to meet the labeling requirements can have certification and testing requirements.

Methodology

This section discusses the study approach, which included a literature review and interviews. Reports and studies were reviewed from the Collaborative Labeling and Standards Program (CLASP), ACEEE (American Council for an Energy Efficient Economy) Summer Study conference proceedings, and the European Council for an Energy Efficient Economy) conference proceedings. Interviews were completed with major contracts from the United States, Australia, Japan, Canada, China, and the European Union. The interviews collected the following information:

- Role of person
- Jurisdiction of agency
- Standards and enforcement strategy documents
- Regulatory structure
- Standards development process

- Implementation/enforcement strategies for testing and certification, proper labeling and marketing of the certified efficiency, and proper withholding of non-complying models from the entity's area of jurisdiction.
- Experience with various appliance regulations in terms of compliance success? What are the success factors? What are the barriers?

Findings

This section discusses the overarching issues that were repeatedly brought up during the interviews and literature review.

Mandatory vs. Voluntary Regulations

Both, the labeling requirements as well as the requirements for minimum energy performance standards can be mandatory (required by law) or voluntary (commitment by industry or negotiated agreement between industry and regulatory agency). For the regulatory agencies, the option of creating voluntary vs. mandatory standards is often dictated by the regulatory powers available to the agency, its relationship with manufacturers/retailers, the strength and inclination of the industry groups towards energy efficiency, and the legislative goals set by the government in charge. While voluntary regulations are easier to negotiate due to agreement of all parties, there is the concern of manufacturers/retailers not meeting their commitments due to various business reasons other than lack of technology improvement. Mandatory regulations require a lot more rigor and analysis to establish so that the requirements meet the goals of the government, and at the same time ensure that industry groups cooperate with the setting of the regulations and their enforcement. In either scenario (voluntary or mandatory), effective monitoring is critical to finding out how well the regulations are being complied with.

Enforcement Strategies

There are numerous strategies used by agencies around the world to ensure compliance with appliance efficiency regulations, but these can be roughly divided into positive reinforcement (carrot approach) or negative consequences (stick approach). There are also informational resources that support both these approaches.

The carrot approach usually involves:

- Publications of standards and supporting documents (getting the word out)
- Appliance database(s)
- Basic performance labeling requirements
- Reporting forms and procedures for manufacturers and retailers
- Positive publicity in government websites, newsletters
- Labels touting good performance that manufacturers or retailers can use to promote their efficient products (e.g. Energy Allstars, Energy Star, EnergyLabel, etc.).
- Compliance credits in code – this is often used for emerging efficient technologies to promote their market adoption.
- Financial incentives for efficiency improvements such as tax credits

- Procurement policies by government agencies

The stick approach usually involves:

- Negative publicity through government newsletters (e.g. Australia and Japan)
- Market studies to understand nature and extent of non-compliance
- Targeted inspections of retailers/manufacturer facilities
- On-the-spot fines for small infractions found during inspections
- Third party product testing to verify manufacturer/retailer stated energy performance of appliances
- Inspection of energy efficiency documentation by customs officials during import checks
- Formal notices of non-compliance to manufacturer/retailer
- Civil lawsuits if the manufacturer/retailer does not respond to formal notices
- Impounding non-compliant appliances
- Financial penalties through civil lawsuits or negotiated settlements, or mandatory penalties

How Implementation Strategies Affect Enforcement of Regulations

A number of people interviewed during the study emphasized that good enforcement cannot be done without a good process of standards development and implementation that is inclusive, transparent, and has backing from all stakeholders. Having all stakeholders – especially manufacturers – participate in the standards development and implementation process is seen by the interviewees to be the key to ensuring higher compliance. It is the contention of these interviewees that when a level playing field is created through appropriate test standards and incentives for better performance, manufacturers will often police each other. As one of the interviewees noted, there should not be a hard separation between implementation and enforcement efforts, and often a good implementation plan that is developed through stakeholder participation and commitment wins half the enforcement battle.

An example of this is the United Kingdom (UK) where the appliance labeling requirements are being implemented and enforced through a partnership with industry and publicly funded independent agencies such as the UK Market Transformation Program and the UK Energy Trust (Lock and Hudson, 2006).

Having a robust central database of appliances including make and model numbers available to the public and the retailers helps keep all stakeholders informed about compliant products. This is done in Australia, Canada and California. The same database can also be used by customs and border agents (such as in Canada) to keep non-approved equipment out of the market by denying entry. The database also provides information for consumers which may spur manufacturers to enhance the energy efficiency of their products.

Role of International and Inter-State Cooperation on Enforcement

The current nature of the commodity market and the supply chains of most appliance manufacturers mean that, for almost all countries, a majority of their appliances are imported and not domestically manufactured. China, Japan, and to some extent Korea are the exceptions in that they are increasingly becoming bases for appliances manufacturing. One of the theories for standards

development and enforcement, as seen through the experience of European Union (EU) and the Asia-Pacific Economic Cooperation (APEC) countries, encourages joint standards development across international borders in order to create sufficient market force for change in appliance efficiency. Australia for example often works with other countries in Asia to improve the energy standards in these Asian countries that are often the manufacturing base for appliances sold in Australia. The Asian countries follow Australia's lead in promoting efficiency as part of their standards implementation and enforcement strategy due to the active role played by Australia in negotiating international cooperation on Australia's own energy efficiency standards and labeling programs. If more countries share similar requirements, there is greater incentive for manufacturers to follow the law. In some cases like China, which is emerging as a manufacturing hub, greater energy efficiency inside the country can have an equally big impact on energy efficiency in other countries that import equipment manufactured in China.

On the US national level, due to weak federal standards, many states are emulating California's appliance regulations. They include Arizona, New Jersey, New Hampshire, New York, Texas, and Florida. As mentioned later in this report, several states have set up a mechanism to piggyback on California's certification requirements. Thus, standards development in California helps develop standards for several other states. While this may seem like a disadvantage in terms of resource allocation for California, having a larger market where the same labeling requirements are in effect increases the incentive for manufacturers to follow the standards. The possibility of being penalized in multiple states for non-compliance in California is sure to influence decisions by manufacturers (and even retailers who sell in multiple states).

Role of Test Standards on Enforcement

In order to enforce appliance standards and labeling requirements it is critical that the testing procedures and labels are continually updated to account for newer technologies and improved understanding of equipment operation. If the test standards are viewed as being cumbersome (too onerous) or irrelevant (too old to account for technological improvements) then there is more incentive for manufacturers and retailers to sell non-compliant equipment or equipment whose control strategies make them "test better" than how they work in reality.

On the other hand, there can be technological improvements that can allow equipment to circumvent the intent of the test procedures and thus the standards/labeling requirements. If the test standards are not updated regularly, then the chance of equipment that meets the letter of the law but in practice uses more energy than allowed increases. An example, as seen in Australia, one manufacturer was found to have exploited a loophole in the existing test standards for refrigerators that allowed it to claim lower energy consumption than what the product actually consumed.

Another aspect to the test standards is the metric used to define compliance with the underlying standard/labeling requirement. In the case of Japan, the test standards are indexed to the size of equipment and generally allow greater energy consumption for larger equipment. Basing the test standards on energy use intensity (such as kWh/sf of screen size of monitors, or kWh/ton of air conditioning) instead would not allow higher power consumption in this larger equipment; and incent towards buying adequately sized equipment (i.e., provide a disincentive to buy bigger).

Developing and continually monitoring test standards against appliance efficiency improvements are key measures to ensure a level playing field for all manufacturers, and to keep test standards relevant as technology improves. Surely, this process is neither a simple nor a fast method of ensuring compliance. However, in the absence of updating test procedures in response to technology development, the temptation for manufacturers to find loopholes in the test procedures increase. Continuous review and upgrades to

MEPS and test standards help foster increased attention by manufacturers to their equipment's EE, and enhance the RD&D resources devoted to this.

Role of Continuous Proactive Market Studies/Surveys in Enforcement

This step dovetails with the previous step about test standards. Without an active enforcement effort that includes proactive market-level studies (market intelligence) and targeted inspections, it is often not possible to catch loopholes in appliance standards or systematic abuse of the standards. In Australia for example, non complying refrigerators were independently tested (testing was commissioned by the government, but carried out by an independent testing facility) and found to be non-compliant as a result of their ongoing enforcement efforts.

Continuous and methodical market studies and third party product testing greatly improve compliance rates as evidenced by Australia in their aptly titled policy report "When You Keep Measuring It, You Know Even More about It!." (National Appliance and Equipment Energy Efficiency Program Report No: 2005/05) Third parties are often independent testing laboratories such as Underwriters Laboratories (UL), consumer advocacy groups and other government approved testing laboratories that are not affiliated with any particular manufacturer or manufacturer association. In Canada and Australia, government approved laboratories conduct third party testing.

Most enforcement agencies have limited budgets to conduct enforcement activities, and the number of products to be regulated increases every year. Results for Australia showed that the key to a good enforcement mechanism is to target the enforcement efforts by collecting information from various sources (retailer surveys, selective product testing, manufacturer data, etc.) about those appliances and retailers/manufacturers that are suspected of non-compliance (Artscraft Research 2006). Developing such market intelligence involves cooperation from manufacturers associations, retailers and consumer groups. In Germany for example, one of the interviewees noted that consumer magazines such as "TEST" are often the most active supporters of standards enforcement and conduct independent product testing as part of their consumer awareness efforts.

Prioritized Compliance Enforcement Recommendations

The authors have identified several enforcement strategies that need to work together in order to achieve the goal of increased compliance with appliance regulations, organized into short-term (immediate), medium-term and long-term steps. These terms refer to the amount of time it would take a regulatory agency to implement the measures based on regulatory and budgetary constraints. The categorization does not mean that efforts on the long-term measures need to start in the long-term. Rather, efforts for all measures should be started at the earliest opportunity by regulatory staff. The categorization merely points out that some measures can be adopted immediately, while others will take more sustained efforts to implement.

Short-term (Immediate) Enforcement Steps

Enhance Informational Resources. The first priority of the compliance efforts should be to make sure that stakeholders know what the regulations are. There is a clear need for better education of these stakeholders on what the regulations are and what their responsibilities are. This includes both the need to find the appropriate stakeholder to educate, but also better education and information resources to explain the intent and content of the regulations. Lack of knowledge can greatly enhance 'accidental

non-compliance', where the stakeholders are engaging in non-compliant activity because they are not aware that the particular appliance is non-compliant.

Establish Compliance Partnerships. Other entities, such as utilities energy efficiency programs, have identified a similar need for greater education of their customers in order to improve compliance. The regulatory agency and other entities must initiate constructive and comprehensive discussions to ensure that each entity can support the actions of the other, and the information resources developed are complementary and effective.

Perhaps most important, the regulatory agency must establish consistent and ongoing relations with large retailers and distributors. These entities have been consistently identified as the key stakeholders responsible for compliance, and ones that can influence the point-of-sale of all regulated appliances. These entities are also often the source of information on non-compliance by their peers. Having a more structured partnership with the retailers and distributors would provide a forum for a regulatory agency to understand their concerns and tailor enforcement resources to meet current gaps in compliance.

Tap into the Social Aspect to Compliance through a "Non-Compliance" Hotline. The participation of the consumer groups (business or home) can only assist in any compliance enforcement efforts. Consumer groups can be an important ally by reporting instances of non-compliant appliances being sold in the state. For example, if a consumer spots a non-compliant torchiere being sold in a store, it would help the enforcement efforts of the regulatory agency if the consumer has an avenue to convey that information. To that end, it would be a good idea to establish a 'Non-Compliance Hotline' for consumers to call or email their complaints regarding non-compliance. There are several options for providing a hotline. The efficacy of this compliance hotline is subject to the knowledge of the consumers – the less educated and aware the consumers are the less effective this approach will be. However, the link has other advantages in that it will provide immediate visibility to the issue of standards compliance.

Medium Term Enforcement Steps (1-3 years)

Systematic Market Surveys. The issue of compliance enforcement is somewhat complicated by the 'chicken-and-egg' problem of lack of knowledge of the market, and lack of efforts to regulate the market. Without knowledge of where and how non-compliance happens, it is hard to target compliance enforcement efforts. On the other hand, without sustained compliance efforts, the areas of non-compliance may keep growing. Many entities around the world – Australia is perhaps the best example of this – have realized that the solution to this problem is sustained efforts at understanding the market and the impacts of existing enforcement actions. These are best done through structured and repeated market surveys. In Australia for example, they repeat the same market study every year (Artscraft Research 2006). This helps track progress of compliance efforts, identify patterns in non-compliance and guide changes to policies.

Partner with Utilities / Consumer Groups / Retailers. The regulatory agency needs to set the agenda for the quantity, quality and accuracy requirements on the market studies. It also needs to set a mechanism for review of the market results, and develop recommendations for future compliance actions.

Publish Findings. In addition to conducting the market studies, it is equally important to understand the

implications of the findings and to develop work-plans based on the survey results. Publishing the survey findings would enable partners and other experts to provide feedback. It will also enable the commission to get all stakeholders that were not part of the survey efforts to understand where the non-compliance is occurring, so they can take corrective measures as needed or assist in better enforcement actions.

Create/Maintain an Appliance Database. Many regulatory agencies maintain agencies maintain a database of regulated appliances. This database can be easily updated or tracked as more market intelligence is gathered from surveys. If surveys uncover appliances that are not listed in the database, the regulatory agency staff can initiate actions to have the manufacturers certify their appliances so that their appliances may be added to the database. The other reason for keeping the database updated is that the database can serve as a basis for identifying appliances that may not meet the code requirements, and thus trigger follow-on actions. Or help customers buy the most EE ones…

Need for Transparency. One of the challenges to compliance enforcement efforts is the often secretive nature of the enforcement proceedings. Indeed it is often necessary to conduct enforcement activity away from public attention to achieve a successful resolution. To take a page from Australia and Japan, the more transparent the process of enforcement becomes, the more aware the average consumer/retailer is about appliance standards.

Compliance Scores. A regulatory agency can develop compliance scores for stakeholders to rate product compliance with the standards. These scores can be made public, along with the enforcement actions taken by the Energy Commission related to those findings. Those entities that are following the regulations would then benefit through positive publicity, while others that are not complying will have reason for corrective action – greater public awareness of non-compliance may put them at a competitive disadvantage with those that comply with standards.

Enforcement Newsletter. One of the means of providing a structured flow of information about enforcement actions and results is a periodic compliance newsletter. The newsletter can serve as a forum to highlight accomplishments, partnerships and invite participation from all stakeholders.

Long Term Enforcement Steps (3 years of more)

Enforcement Powers. All the studies, publications and partnerships may not be sufficient to deter those that are intent on not meeting the code provisions. To deal with code violations, it is very important that a regulatory agency has authority to impose significant punitive measures. An additional avenue for punitive action may be in the form of giving enforcement staff the authority to impose on-the-spot penalties for non-compliance. Such strategies have proven successful in Australia for example.

In more extreme cases, there may be some merit to have the authority to detain or remove non-compliant equipment from the stream of commerce while other enforcement actions continue. However, this approach requires more man-power, and has more potential for conflict between enforcement staff and stakeholders. It nevertheless will have the power to send a powerful warning to those willing to risk non-compliance – namely, the loss of goods, market sales and therefore money.

Conclusions

The use of appliance standards by regulatory agencies is an important tool in influencing energy efficient products in the marketplace. However, the effectiveness of appliance standards is dependent on regulation compliance. Thus, a regulatory agency requires enforcement strategies to verify and increase compliance regulation. In this paper, we have identified several strategies for a regulatory agency to consider for incorporation into their appliance standards enforcement efforts. There is not a single 'magic bullet' solution to improving standards compliance and adoption of a comprehensive approach that includes several strategies is recommended. Utilizing the lessons learned from other agencies provides important examples on the development and implementation of various enforcement strategies. Ongoing monitoring of compliance will help ensure that regulatory agency policies are accomplishing their goal.

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