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Regulations and Standards in Energy Efficiency: the Role and Importance of Effective Compliance

**WEC-ADEME Case study
on Energy Efficiency Measures and Policies**

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Acronyms

ANEC	The European consumer voice on standardisation issues
APEC	Asia-Pacific Economic Cooperation
CLASP	Collaborative Labelling and Appliance Standard Programme
CO ₂	Carbon dioxide
EuP	Energy using product
GHG	Greenhouse Gases
HVAC	Heating, ventilation and air conditioning equipment
IEA	International Energy Agency, based in Paris
MEPS	Minimum energy performance standards
OECD	Organization for Economic Cooperation and Development, based in Paris

Introduction

Promoting energy efficiency requires a range of policy options. One set of options is regulations and standards, which provide long-term policy signals and can be applied in all end-use sectors. However, the use of regulations and standards depends on good implementation and effective compliance. This paper focuses on the importance of compliance; how it is addressed in regulatory measures that are being used to promote energy efficiency; and, what can be done to improve compliance.

Regulations and standards apply not only to specific technologies and systems, e.g. refrigerators or buildings, but are also used to regulate the availability and quality of information, particularly at the point-of-sale such as in the labelling of energy-using equipment or vehicles. Regulations and standards can also be used to require:

- energy managers in large companies, or within an industry sector itself, to monitor and report overall energy use to government;
- energy companies to undertake specific, end-use energy efficiency activities including measuring their energy use.

While regulations and standards are normally mandatory, voluntary schemes on labelling or energy performance can also have a similar impact. This paper, therefore, looks at both the mandatory and voluntary sides of compliance.

Background

It is a common global practice to use regulations and standards in all end-use sectors to promote energy efficiency. Their use became regular practice after the first oil crisis in the 1970s. In the United States some of the first regulations included fuel efficiency standards combined with labelling at point-of-sale. Some countries, such as Canada and some European countries such as France, also started appliance-labelling programmes in the 1970s.

While the 1980s saw little regulation activity, the 1990s ushered in numerous initiatives in many regions and countries; the momentum has been building steadily since. Despite a growing number of national efforts, the majority of activity occurs at the international level due to global trade in energy-using products.

Regulations represent a powerful instrument to promote energy efficiency but their design and implementation requires great care to ensure a positive impact. An important aspect of effective implementation is good compliance. Unfortunately compliance is frequently overlooked or under-funded. Moreover, there are few evaluations of programmes that focus on compliance.

This paper first provides a short introduction to the use of regulations and then looks at the issue of compliance as an essential component in designing and implementing regulations.

Through the use of a series of case study summaries, this paper outlines why compliance is a serious issue and one that needs to be dealt with comprehensively by policymakers and

programme implementers. Some of the case study summaries¹ provide examples of how to adequately integrate “compliance” into regulatory schemes.

Where regulations are used

Regulations and standards are used in all end-use sectors to promote energy efficiency.

Residential Sector

Within this sector, there are numerous categories of appliances, lighting and equipment that are regulated by either performance standards, labelling or both. These standards can be mandatory or voluntary.

Regulations are used for thermal efficiency of building codes for both the construction of new buildings and frequently for the renovation of existing buildings. Building codes did not incorporate thermal efficiency in any meaningful way until the 1970s. Since then, their use to promote thermal efficiency has grown significantly.

Commercial/Public Sector

Building codes as well as many of the same regulation and standard that apply to the residential sector apply here. In addition, there are performance standards and labelling for certain office and HVAC equipment. Voluntary agreements in this sector are a close alternative to regulations.

Transport

There are several regulations related to improving energy efficiency in transport. Some countries have fuel efficiency standards for new vehicles, particularly for passenger cars.² The standards are often accompanied by labelling at point-of-sale. The European Union does not have specific fuel efficiency standards, although there are labelling requirements for vehicles at the point of sale. The European Union also addresses fuel efficiency indirectly through CO₂ emissions targets.

Voluntary agreements are used in this sector, particularly for vehicle fleets. There are also regulations on fuel quality that have an indirect effect on fuel efficiency.

¹ The case studies are heavily weighted towards standards and labelling of appliances (European Union, Argentina, Australia and China), building codes (United States) and voluntary agreements (Finland) and reflect evaluations and other analyses available.

² While normally mandatory, they can be voluntary as in the case of Canada. Even countries without fuel efficiency standards often have measuring systems for fuel economy that can be used for appliance labelling.

Industry

Traditionally, industry has faced fewer regulations. When used, industry regulations are often applied to the non-process aspects of industry. Regulations that do exist are in relation to environment issues and include emission levels, regular auditing, boiler inspections, preparation of energy efficiency plans or the appointment of energy managers. Regulations also exist for regular reporting of energy use.

Many countries have voluntary agreements with industry associations or specific enterprises. While voluntary, these agreements can often be linked to audits and subsidy schemes, thus requiring a certain level of compliance.

Other

Some countries have legislation requiring energy companies to implement various demand-side initiatives.

Some Comments on Regulations

Regulations have become more prevalent in recent years. This is in large part because of the growing importance of energy efficiency in meeting energy and environmental (mainly climate change) objectives as well as standards set by global, regional or national trade agreements. For example, in the European Union, with climate change becoming a key priority, and given the trade of many energy-using products with the EU, regulations have focused on improving the functioning of internal markets

Regulations are widely used—in part—because they have been proven effective in lowering energy consumption of specific appliances and equipment. A 2007 report from the International Energy Agency (IEA) included the following examples:³

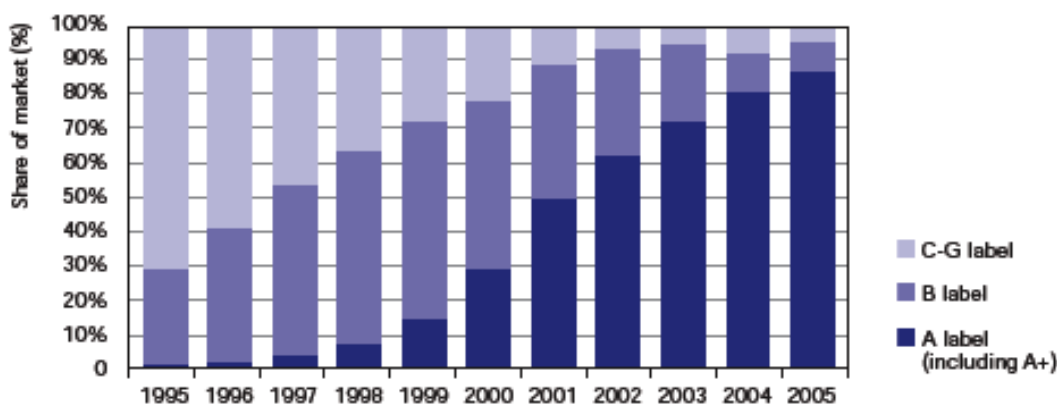
- A 40% drop in the average energy consumption of the refrigerators in Australia since 1993;
- A drop of 60% in the average electricity consumption of refrigerators and freezers in the US between 1980 and 2001. After the introduction of minimum energy performance standards (MEPS) in 1993 and 2001, energy consumption dropped 20 % each time; and,
- A 20-25% drop between 1980 and 2001, in the energy consumption of refrigerators and freezers in the United Kingdom. Labels were introduced in 1995 and MEPS in 1999.

The following figure shows how “A” and “A+” labels increased in market share in Denmark between 1995 and 2005 for cold appliances. These cold appliances now represent over 80 % of the market share.⁴ This figure illustrates the value of using a combination of regulations and standards.

³ IEA (2007), *Experience with Energy Efficiency Regulations for Electrical Equipment*, Information Paper, International Energy Agency, Paris, 2007, pp 5-51

⁴ IEA, *Gadgets and Gigawatts*, OECD, Paris, 2009, p. 93.

Figure 37 • Sales of cold appliances in Denmark, 1995-2005 by energy rating



Source: DEA, 2006.

Why Compliance is a Major Concern

Regulation compliance has gained attention in recent years with the growing evidence that compliance can have a major impact on the overall effectiveness of programmes. According to many experts, poor implementation—due in large part to non-compliance—can reduce a programme’s impact by 20-50 %. As noted by the chair at a 2008 IEA workshop on compliance, indicative levels of non-compliance span approximately 25% for appliance programmes to 50% for building regulations.⁵ On the other hand, a UK consultation report on non-compliance stated that poor compliance lowered the impact by 6.2%.

A study undertaken by ANEC,⁶ the European consumer voice on standardisation issues, suggests that about 15 % of energy using products on the market are non-compliant.⁷ The UK government believes that the estimate is conservative and that it could be as high as 25 %.⁸

Unfortunately, there are few documented studies but anecdotal evidenced illustrates how crucial effect compliance is if the specifications of regulations and standards are to be achieved. The “average” compliance is not well assessed to this point.

It is therefore important to first better understand the concept of compliance.

⁵ Chair’s Summary, IEA Workshop, *Meeting Energy Efficiency Goals: Enhancing compliance, monitoring and evaluation*, IEA, 28-29 February 2009, p. 5. Anecdotally, other experts have expressed their views that 50% is too high but provide no evidence to support this claim.

⁶ For more information on ANEC, go to www.anec.org.

⁷ For more details on this ANEC study see Mark Ellis, Ingrid Barnsley and Shane Holt, *Barriers to maximising compliance with energy efficiency policy*, eceee summer study 2009 proceedings, p. 344.

⁸ Consultation on the Implementation of the Market Surveillance and Enforcement Requirements of the Eco-design of Energy Using Products and Energy Labelling Framework Directives, DEFRA, June 2009, p. 6.

Compliance: What does the term really mean?

Ellis et al., define compliance broadly “to indicate where an actor that is the subject of a policy acts in accordance with the specifications of that measure.”⁹ They state that compliance is not black or white “with either full compliance on the one hand, or zero compliance on the other. Rather, most programmes include multiple requirements spanning both process and performance issues, and non-compliance can occur at any of these levels.” Therefore, Ellis et al., prefer the terms optimal and sub-optimal compliance to describe the level of compliance

Compliance is important for the overall integrity of a measure. If compliance is poor, the public can lose confidence in the measure thus reducing its credibility and overall impact. Once trust is lost, it is hard to regain. This has occurred in several EU countries where an energy performance certificate for buildings is required before a sale is complete. However there have been problems in implementing this element of the European Performance of Buildings Directive.¹⁰

In industry, compliance problems can lead to misplaced investments – or investments that do not achieve the expected economic return.

The principal problem with inadequate compliance is that policy objectives are not met, thus affecting an entire regional or national energy efficiency strategy. In many countries, the priority for energy efficiency is already tenuous. Poor compliance can adversely affect the decision-makers and public’s support for energy efficiency.

Establishing a compliance system can be complex and relatively expensive, discouraging many governments from developing the systems. Institutional issues can further complicate the process. In many jurisdictions, building codes are established by the national (or state/regional) government but the enforcement of the code is the responsibility of the local authority. This can lead to resource concerns because often the jurisdiction for enforcement has other priorities or budget constraints and need support from the national body.

Regardless of these barriers, all experts agree that a functioning compliance system is necessary for the overall impact and sustainability of the strategy, so the issue is not whether or not to ensure compliance but how to do it well.

Addressing Compliance

Regulatory programmes are increasingly used in energy efficiency strategies today, and as shown above, benefits that accrue from compliance can be significant. Standards can require minimum performance and thus it “guarantees” results that other instruments (information, financial instruments) cannot. This is particularly valuable when needing to meet specific targets or policy objectives (e.g. climate or energy security). Standards and labelling are

⁹ Mark Ellis, Ingrid Barnsley and Shane Holt, Barriers to maximising compliance with energy efficiency policy, eceee summer study 2009 proceedings, p. 342.

¹⁰ For a good example, go to http://www.eceee.org/columnists/Rod_Janssen/confessions/

increasingly important for energy-using, traded goods and will probably be raised at upcoming international trade policy discussions under the Doha Round of the World Trade Organisation.

Standards and labels are used for a wide array of energy-using equipment. Products range from televisions to ballasts to light bulbs to computers and have various life-spans. However because energy services are expanding rapidly, it is important that market transformation take place through the deployment of highly efficient equipment regardless of a product's lifespan. But, efficient market transformation will not take place unless there is good compliance. If there is leakage in the system that allows for sub-optimal energy-using products to be deployed, then the full, expected impact of the energy savings will not be achieved. This can seriously affect national, regional and global energy efficiency targets.

Standards and labels work best as part of a holistic market transformation strategy. Standards ensure that the worst performing products are removed from the market, while labels encourage consumers to purchase increasingly more efficient products. These can be further supported by direct incentives to support the introduction of leading-edge products through R&D support, subsidies, procurement, etc. However, standards and labels are fundamentally different in that labels support consumer choice in the market and provide manufacturers with benchmarks for product performance, while standards limit the choices available to manufacturers and consumers. A key decision facing policy makers is the appropriate mix between these and other measures. This will be influenced by factors including domestic market sizes, manufacturing capacities, economic conditions, energy costs, and international developments.

Energy Charter Secretariat, *Policies That Work, Introducing Energy Efficiency Standards and Labels for Appliances and Equipment*, Brussels, 2009, p. 7.

Case Study Summaries: Introduction

The summaries presented here illustrate many of the issues that impede the effective implementation of regulations. There are numerous variables that can lead to sub-optimal results:

- programmes are poorly designed and implemented;
- management problems occur;
- measures are underfunded and given low priority by governments;
- institutional issues arise from different ministries being responsible for various aspects of implementation; and
- inter-governmental institutional problems are generated, e.g. between levels of government within a country).

Successful compliance therefore requires a rigorous approach. There is a growing body of literature on this topic but unfortunately there are few evaluation programmes that give insight into how the compliance process was carried out and how issues were resolved. Thus the information that is readily available tends to be case studies that are a mixture of evaluations, studies, peer-reviewed papers and briefings.

The case studies summaries have been selected to demonstrate various aspects and challenges of compliance. The summaries outline programmes from Argentina, Australia, Canada, China,

the European Union, Finland and the United States and predominately focus on appliance standards and labelling. Voluntary agreements from Finland are included, in large part to show how monitoring and compliance evolved as implementation continued. Building codes are discussed for the United States. Unfortunately there are no case studies on regulations in the transport sector.

Case Study Summaries

Argentina

Standards and Labelling: The Argentinean Energy Efficiency Standards and Labelling Programme were first initiated in 1996, within the framework of a bilateral cooperation with the European Union. Between 1997 and 2000, the *Programa de Calidad de Artefactos Energéticos para el Hogar* (PROCAEH) elaborated test procedures and labelling standards for refrigerators and freezers. After being suspended, the Programme was reactivated in 2005. The pace of both the elaboration of test procedures, labelling standards and of the regulatory acts to make labelling mandatory were slow. This lag was due to the institutional problem that the National Energy Secretariat had no legal power to issue standards and regulations. A study by Adviesbureau voor Energiestrategie (AES) and CLASP revealed that there were major shortcomings in compliance with the mandatory energy efficiency labelling scheme

Australia

Labelling: The Energy Rating Label is a category-type label and is mandatory for all relevant appliances sold in Australia. There are labels for refrigerators and freezers, clothes washers and dryers, dishwashers, air conditioners and televisions. Since 1993, state governments have been evaluating the impact of the energy-labelling programme by tracking the efficiency of appliances available on the market. Each year a report is prepared detailing the trends in appliance efficiency. Compliance is well integrated into the energy efficiency approach.

Canada

Labelling: The Energy Efficiency Act of 1992, which authorises minimum energy performance standards, became the cornerstone of Canada's energy efficiency programme. While a labelling scheme had been in place since 1978, there were no minimum energy performance standards for energy-using equipment. Today there are regulations in place for more than 30 products that consume 71 % of energy used in the residential sector and 50% of the energy in the commercial and institutional sectors. In 2006 the government announced that it would set standards for 20 new products and increase the stringency of existing standards for 10 products by 2010. Since then Canada has followed through on its plans and has increased the standards for most of the products it said it would. Included in these new standards are stringent requirements for stand-by power that includes both residential and commercial products.¹¹ In

¹¹ Full descriptions of all the products and the status of new standards, together with compliance requirements, are available at http://oee.nrcan.gc.ca/regulations/home_page.cfm?attr=0. Many of the new requirements are already in effect, while others are coming in between 2011 and 2013.

addition, Canada has a compliance policy document for the Energy Efficiency Act and the Energy Efficiency Regulations. The government's philosophy is to have as much voluntary compliance as possible and to keep the administrative burden to a minimum. To ensure that dealers comply with the labelling requirements, there are three monitoring mechanisms: 1) self-monitoring by dealers; 2) tips and complaints; and, 3) information from inspectors and other government officials.

China

MEPS and Labelling: China has had various standards and labels for appliances since 1989 when China first adopted MEPS. In 1998 a voluntary endorsement label was introduced. Currently there are MEPS for 22 appliances and 50 products using a voluntary endorsement label that is based on the US Energy Star label. Assessments of compliance in 2006 and 2007 revealed that while most products meet the claimed performance levels, there are also cases of non-compliance. Varying compliance rates were observed both by product type and city.

European Union

Labelling: In 1992 the European Union introduced a labelling scheme for a range of household appliances. This was introduced to help implement the internal EU market because certain Member States already had their own voluntary schemes for energy labelling and there was a need for harmonised labels in the single market. The EU regulatory framework regarding labelling of energy-related products is set in the Energy Labelling Directive (92/75/EEC) to which implementing Directives for a range of household appliances have been adopted. Under the Directive, the retail trade is obliged to post energy labels and list technical data in table form in the sales records for all appliances displayed in salesrooms. The appliance supplier is required to provide this information.

Finland

Voluntary Agreements: In 1992 the government signed agreements with the Confederation of Finnish Industries, the Energy Federation of Finnish Industries and various sector organisations, to undertake energy efficiency actions and reduce GHG emissions. By the end of 2005, 85% of industrial energy consumption was covered within an agreement. Following the evaluation, a new programme for 2008-2016 was established. The new agreements for 2008-2016 are linked to the EU's Energy Service Directive that has national targets. The monitoring system was also revised to be more flexible and easier to use.

United States

Building Codes: New buildings account for one-third of the total energy use in the United States and two-thirds of all electricity consumption. While US states had building codes prior to this, the 1992 Energy Policy Act ("EPAAct") mandated that all states must review and consider

adopting the national model energy standard. There is increasing importance being given to building codes in the US. On June 26, 2009 the US House of Representatives passed the American Clean Energy and Security Act of 2009 (ACES). The ACES aims to significantly change American building energy efficiency policy by mandating a new national building energy code and providing for federal enforcement in state and local jurisdictions that cannot or will not comply.

Compliance Issues

Australia, Canada, Finland and the United States have been very active in integrating compliance directly into their programmes. China is in the process of integrating compliance while the European Union leaves it to its member states. Under the EU system compliance can be difficult to “enforce” because it is so de-centralised to the member state level. This means the level of compliance can vary significantly between member states.

Compliance Policy

Having a stated policy on compliance is important because it gives attention to the issue; it explains stakeholders’ obligations and make the entire process transparent for all; and, reflects the priority that the government is giving to the issue. As an example, Canada integrated a compliance policy into its standards development right from the start and its public compliance document is readily available for all stakeholders to consult. Australia has a similar, rigorous approach. In the European Union compliance is built into the Eco-design directive as illustrated in the following box.

Eco-design Directive 2005/32/EC of the European Union

Article 3

Placing on the market and/or putting into service

1. Member States shall take all appropriate measures to ensure that EuPs covered by implementing measures may be placed on the market and/or put into service only if they comply with those measures and bear the CE marking in accordance with Article 5.
2. Member States shall designate the authorities responsible for market surveillance. They shall arrange for such authorities to have and use the necessary powers to take the appropriate measures incumbent upon them under this Directive. Member States shall define the tasks, powers and organisational arrangements of the competent authorities which shall be entitled:
 - (i) to organise appropriate checks on EuP compliance, on an adequate scale, and to oblige the manufacturer or its authorised representative to recall non-compliant EuPs from the market in accordance with Article 7;
 - (ii) to require the provision of all necessary information by the parties concerned, as specified in implementing measures;
 - (iii) to take samples of products and subject them to compliance checks.
3. Member States shall keep the Commission informed about the results of the market surveillance, and where appropriate the Commission shall pass on such information to the other Member States.
4. Member States shall ensure that consumers and other interested parties are given an opportunity to submit observations on product compliance to the competent authorities.

Building codes are naturally enforced but initially enforcement was for other reasons, e.g. fire regulations and safety (ensuring electrical wiring installed correctly). The proposed

recast of the Energy Performance in Buildings Directive in the EU has an entire article and an annex on the requirement and procedures for compliance.

ANNEX II from proposed recast of the EU Energy Performance of Buildings Directive

Independent control systems for energy performance certificates and inspection reports

1. The competent authorities or bodies to whom responsibilities for implementing the independent control system have been delegated by the competent authorities shall make a random selection of at least 0.5 % of all the energy performance certificates issued annually and subject these to verification. The verification shall be carried out at one of the three alternative levels indicated below and each verification level shall be carried out at least for a statistically significant proportion of the certificates selected:

- (a) validity check of input data of the building used to issue the energy performance certificate and the results stated in the certificate;
- (b) check of the input data and verification of the results of the certificate, including the recommendations given;
- (c) full check of input data of the building used to issue the energy performance certificate, full verification of the results stated in the certificate, including the recommendations given, and on-site visit of the building to check correspondence between specifications given in the energy performance certificate and the building certified.

2. The competent authorities or bodies to whom responsibilities for implementing the independent control system have been delegated by the competent authorities shall make a random selection of at least 0.1 % of all the inspection reports issued annually and subject these to verification. The verification shall be carried out at one of the three alternative levels indicated below and each verification level shall be carried out at least for a statistically significant proportion of the inspection reports selected:

- (a) validity check of input data of the technical building system inspected used to issue the inspection report and the results stated in the inspection report;
- (b) check of the input data and verification of the results of the inspection report including the recommendations given;
- (c) full check of input data of the technical building system inspected used to issue the inspection report, full verification of the results stated in the inspection report including the recommendations given and an on-site visit of the building to check correspondence between specifications given in the inspection report and the technical building system inspected.

The **United Kingdom** recently held a public consultation to determine the most appropriate compliance system for its appliance labelling and standards programmes.

The **Australian** E₃ Committee provides a forum to exchange information on enforcement/compliance issues and community information and marketing initiatives.

Organisations such as CLASP and the International Energy Agency have been vocal in support for stronger and effective compliance policies.

The above case study summaries—as well as a range of studies undertaken by various organisations and experts—have been analysed to see what affects compliance implementation, compliance policy, the impact of compliance or non-compliance, the cost of compliance and the role of capacity building and international co-operation.

Barriers

Compliance does not receive the attention it needs and deserves. The reasons are numerous.

- **Lack of manpower** to carry out building code enforcement or verification of labels and standards in general

- **Enforcement is expensive** and often not given sufficient resources. This concerns both enforcement officials and field and laboratory tests.
- **Insufficient time available** to spend on building sites to inspect for energy code compliance
- **Energy codes** are often considered a **lower priority** than other areas such as health and safety.
- **Enforcement officers do not receive sufficient training in energy** elements of building codes
- **Jurisdictional conflicts** resulting in unclear allocations of responsibility
- **Lack of appropriate enforcement powers and processes**
- **Lack of awareness** of the importance of compliance and the effects on overall impact by poor compliance
- **No product registration and reporting requirements for MEP (China)** and for only four products for labelling

Essentially, **the barriers can be summed as a lack of priority, awareness and resources.**

Impact of compliance/non-compliance

It is important to have a better appreciation of the impact of effective compliance. To date, there have been few rigorous studies on this; more is documented through anecdotal evidence than through rigorous data gathering and analysis.

There is, however, some important information available. For example, in 2009, the British government produced a consultation report that provided an important quantitative assessment of the impact of one programme, linking it to the both the costs and the benefits of non-compliance. Internal projections for the total benefits—assuming full compliance—from the Eco-design and the appliance labelling directives are estimated at current day value of £11.3 billion. Factoring in the non-compliance that was used in the government’s impact assessment, they estimate that the cost of non-compliance would be £700 million. The government, however, believes this is a “significant underestimation”.¹² The report states that it does not include the costs of an uneven playing field for manufacturers placing products on the market; reputational damage for the United Kingdom if the Directives are not properly enforced; and, the risk of infraction and significant fines from the EU if an appropriate enforcement system is not put in place.¹³

The UK study also includes economic benefits from non-compliance, “because (i) less energy saving results in a lower impact of the Heat Replacement Effect, which is responsible for heating costs to consumers and non-traded CO2 emissions; and (ii) it is possible that some non-compliant products will be offered to consumers at a lower price than projected, because the manufacturers haven’t incurred the full costs of improving their products.”¹⁴ The government estimates the benefits at £336 million, leaving the Net

¹² Consultation on the Implementation of the Market Surveillance and Enforcement Requirements of the Eco-design of Energy Using Products and Energy Labelling Framework Directives, DEFRA, June 2009, p. 7.

¹³ *Ibid.* p. 7.

¹⁴ *Ibid.*, pp.7-8.

Present Value lost at £364 million. The government stresses in the consultation report that this is a significant underestimate.

There have been separate studies in the United Kingdom on compliance in meeting obligations under the buildings regulations. A 2004 study, undertaken by the Buildings Research Establishment (BRE), showed that up to one-third of the houses were non-compliant. Many of the Buildings Control Officers admitted that they did not take energy efficiency seriously and that they would not withhold approval just because the thermal efficiency obligations were not met.¹⁵

One study on China estimated that the standards and labelling programmes currently in place are estimated to save a total of 1143 TWh by 2020¹⁶ which, represents 9% of the cumulative consumption of residential electricity. Experts estimate that the savings will be the equivalent of 11% of anticipated residential electricity use in 2020. The report, however, states that the impact of standards and labels “are diminished in the absence of appropriate enforcement. Although China has a legal framework to undertake enforcement, it lacks adequate financial, administrative and infrastructure support.”¹⁷ The report adds that international support was being provided by the Japanese government to help improve enforcement.

Cost of compliance/non-compliance

One of the major concerns of policymakers is the cost of implementing a measure. Getting an idea of how much compliance will cost is not straightforward; compliance can be quite a complicated process and one that needs careful attention. Moreover, the cost of compliance includes costs for testing laboratories, compliance/enforcement officers, data management etc. For example, the estimated enforcement costs for an appliance labelling programme in the Netherlands is to be about €400,000 per year.¹⁸

However not all compliance activities have to be costly; costs range with regards to the scope of the measure. In China, the total budget for product testing for household appliances, home electronics and lighting was only US\$72,000. This was, however, because the sample sizes are a very small percentage of products manufactured and sold in China and that the budget for compliance activities is very small.¹⁹

Finland estimated that the development costs for the new monitoring system used for its new series of voluntary agreements were about €0.4 million.

¹⁵ More information on this study and other related ones are available on the Energy Efficiency Partnership for Homes website: www.eeph.org.uk.

¹⁶ David Fridley, Nathaniel Aden, Nan Zhou, Jiang Lin, *Impacts of China's Current Appliance Standards and Labeling Program to 2020*, Lawrence Berkley National Laboratory, Environmental Energy Technologies Division, March 2007, p. 1.

¹⁷ *Ibid.*, p. 70.

¹⁸ Personal communication Hans-Paul Siderius, NL Agency, the Netherlands.

¹⁹ ¹⁹ Mark Ellis, Ingrid Barnsley and Shane Holt, *Barriers to maximising compliance with energy efficiency policy*, ecee summer study 2009 proceedings, p. 343.

In summary, there is no easy rule of thumb as to what are reasonable costs for compliance.

Capacity Building and International Co-operation

A better understanding on how to develop and implement compliance systems is needed. It is also important to increase the awareness of the need for compliance. Much of this can happen through greater international co-operation.

As an example, the Collaborative Labelling and Appliance Standards Programme (**CLASP**) has provided standards and labelling technical assistance with national implementation to over 50 countries. It monitors the full extent of standards and labelling globally, the results of which are available on its website.²⁰ Since 1999, CLASP has assisted with the implementation of 24 standards and/or labels. To help improve understanding on implementation, CLASP also has a guidebook on standards and labelling that is available in English, Chinese, Korean and Spanish.²¹

CLASP currently has a study underway that compares standards and labelling test procedures, efficiency metrics, thresholds, certification, accreditation and compliance procedures. This is expected to be released in 2010. CLASP has also teamed up with **ClimateWorks**, a California-based foundation, to set up a best practice network on standards and labelling in North America, China, India, Europe and Latin America. It will help with the technical analyses necessary for further standards development in these regions and it will share the lessons learned amongst the regional networks.

Other international efforts at capacity building are also underway. Two examples are provided below.

Asia-Pacific Economic Cooperation (APEC), Energy Standards Information System that provides:²²

- up-to-date information about appliance and equipment energy standards and regulations;
- links to experts and information related to standards and regulations being used by APEC and other economies;
- a regular newsletter with news updates and a listing of new and proposed standards in the region (APEC Standards Notification Procedure);
- a user-friendly way for Key Contacts in APEC economies to review the listing of standards for their economies so that they can be updated systematically, and on a regular basis; and,
- "Communities of Practice" for experts and officials to discuss efforts to harmonise and rationalise the testing, labelling, and minimum energy standards for specific appliances and equipment.

There are also efforts by industry itself to set up compliance systems themselves. The following box shows an initiative underway in Europe.

²⁰ www.clasponline.org

²¹ For more information, go to www.clasponline.org.

²² <http://www.apec-esis.org>

A voluntary Bilateral Verification Procedure (BVP)

In Europe, through the European Committee of Domestic Appliance Manufacturers (CECED) has established a new protocol to accelerate the correction of inaccurate declarations on energy labels. Under this process, an organisation can challenge the declaration of a given energy label. The challenging organisation and the organisation that is being challenged have a two week period to share documentation and come to an agreement. If no agreement is achieved, then there is a one week period to select a certified laboratory to verify the declaration. The laboratory has four weeks to carry out the testing. Costs are borne by the loser to the challenge. The purpose of the BVP is to overcome problems with enforcement in Europe.

More information is available at www.ceced.org

The **CEECAP - Implementing EU Appliance Policy in Central and Eastern Europe** project supports Central and Eastern European (CEE) countries to create suitable conditions for implementing appliance labelling and efficiency policies in accordance with EU Appliance efficiency legislation and programmes. The project was started in early 2006 and ran for 30 months. It was carried out in 6 countries of CEE (Czech Republic, Bulgaria, Lithuania, Poland, Romania and Slovakia). Main activities included:

- identification of the national experts and decision makers and their training and cooperation, design and preparation of national appliance labelling and efficiency actions;
- identification of key problems and initiation of action to solve them in collaboration with the project target groups; and,
- transfer of international and local knowledge.

Under the project, awareness of major stakeholders on correct labelling has been strengthened, close cooperation with retailer and consumer associations as well as public authorities and energy utilities established. Verification procedures still remain to be strengthened in the CEE countries. Although the project is no longer running it was an important capacity building tool for new Member States of the European Union.

Conclusions and Recommendations

Compliance needs to be rigorously addressed. There are few such studies on compliance; this needs to be remedied in order to better understand the impact of non-compliance and on the costs and benefits of non-compliance.

The good news is that there are more conference papers and presentations available. International organisations, such as the International Energy Agency (IEA), are playing a bigger role in promoting the importance of compliance. The studies they have produced in the past years support stronger compliance regimes. However, this makes rigorous qualitative analysis very difficult, if not almost impossible.

Ellis et al., state that in one study “there was insufficient centralized collection of compliance data making it impossible to quantify the extent and effects of the compliance ‘problem’, let alone undertake analysis that might identify repeat offenders.”²³

It has been shown above that poor compliance can have a long-term negative impact on energy efficiency strategies. Compliance comes at a cost but they are significantly lower than the benefits. Some countries have integrated compliance into their strategies seamlessly and have provided adequate resources to ensure it is done well. However—all too often—countries dismiss the role of compliance and worry little about the resultant impact.

Yet, by and large, more attention is being given to compliance and improvements are being seen as is illustrated in available case studies. But, there needs to be more monitoring and evaluation of the actual compliance systems. Compliance is not black and white. Programmes cannot easily be categorised as in non-compliance and thus the idea of ranking measures as optimal or sub-optimal compliance is more appropriate.

One analyst at the IEA workshop presented the following suggestions for improving monitoring and enforcement:²⁴

- A dedicated and integrated monitoring and enforcement agency with clear responsibility and adequate funding;
- A mandatory reporting and certification system for all products covered under the mandatory standards and labelling programs;
- An expanded and transparent verification testing programme that includes all products covered under the mandatory standards and labelling programmes;
- Creating a national registry and reporting requirement for MEPS products;
- A strong network of testing laboratories accredited by the CNCA;
- Improve the consistency of test results;
- Credible penalties for non-compliance;
- A clear procedure for dispute resolution;
- Other than the top-down regulatory approach, the U.S.’s manufacturer self-regulation approach could be effective for China as well. Anonymous reporting hotline could be set up for companies to check each other.

Recommendations

The following recommendations are offered to help improve the awareness of and the implementation of good compliance system.

- As countries design and implement new programmes, it is important to integrate compliance from the beginning. This will be less expensive and more effective.

²³ Mark Ellis, Ingrid Barnsley and Shane Holt, Barriers to maximising compliance with energy efficiency policy, ecee summer study 2009 proceedings, p. 344.

²⁴ Presentation by Zhou Na at workshop on Meeting Energy Efficiency Goals: Enhancing Compliance, Monitoring and Evaluation, February 28-29, 2008, www.iea.org.

- It is useful to look at the UK example of consultation and compliance. By reaching out to the full range of stakeholders, this allows for better awareness of issues and greater agreement on the way forward.
- All programme evaluations should include an analysis of compliance as a factor in determining overall impact.
- More analysis is needed as to why compliance is not being implemented well.
- There should be a better sharing of best practice on compliance methods.
- More capacity building initiatives are needed to improve the development and implementation of compliance systems.