Compliance Counts:
# A Practitioner's Guidebook on Best Practice Monitoring, Verification, and Enforcement for Appliance Standards & Labeling
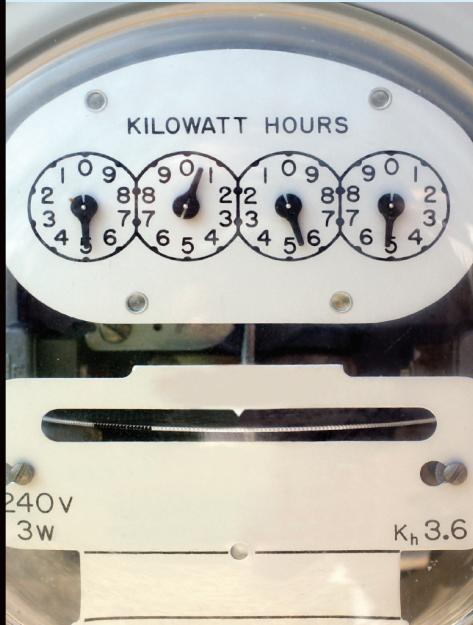
By

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in Partnership with
the Collaborative Labeling & Appliance
Standards Program (CLASP)

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Disclaimer

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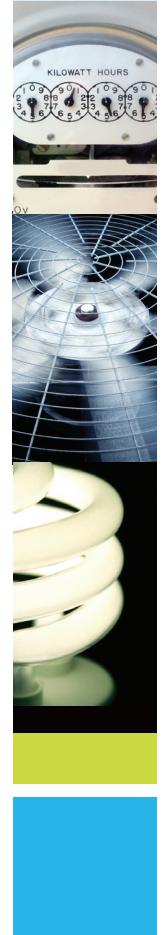
Abbreviations and Acronyms

ACCC	Australian Competition and Consumer Commission
ANOPR	Advance Notice of Proposed Rulemaking
CBSA	Canada Border Services Agency
CE	Conformity Mark on products in the European Economic Area
DOE	Department of Energy (USA)
EEA	Energy Efficiency Act (Canada)
eev	energy efficiency verification mark
EECA	Energy Efficiency Conservation Authority (NZ)
EISA	Energy Independence and Security Act 2007
EPACT	Energy Policy Act 2005
EPCA	Energy Policy and Conservation Act 1975 (United States)
EU	European Union
EuP	Energy Using Products
G8	Group of Eight – Canada, France, Germany, Italy, Japan, Russia, United Kingdom and United States of America
G20	Group of Twenty Finance Ministers and Central Bank Governors – Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, United Kingdom, United States of America and the European Union.
IEA	International Energy Agency
IEC	International Electrotechnical Commission
KPI	Key Performance Indicators
LG	Life's Good, Korean appliance manufacturer
Member States	Member States of the European Union
MEPS	Minimum Energy Performance Standard
MSA	Market Surveillance Authority
NAECA	National Appliance Energy Conservation Act 1987 (United States)
NOPR	Notice of Proposed Rulemaking
NSW	New South Wales (Australia)

ppm	parts per million
QA	Quality Assurance
S & L	Standards and Labelling programme
UK	United Kingdom
USA	United States of America
CBSA	Canada Border Services Agency
NRCAN	Natural Resources Canada
RDCs	refrigerated display cabinets
SCC	Standards Council of Canada
WEO	World Energy Outlook of the IEA
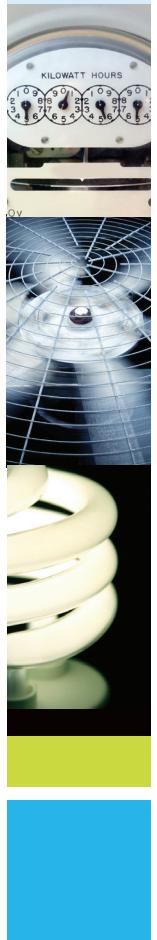
Note from the Executive Director

Energy efficiency standards and labelling (S&L) programmes have proven to be highly effective in stimulating the development of cost-effective, energy-efficient technologies, and are the cornerstone of most national energy and climate change mitigation programmes. In the fight against climate change, S&L for appliances offer enormous carbon reduction potential and are an especially cost-effective policy option for conserving energy – standards can save consumers money, reduce power demand, and slash greenhouse gas emissions.

In 2005 the Collaborative Labelling and Appliance Standards Program (CLASP), with the support of the U.S. Agency for International Development (USAID) and several other organisations and experts, published the second edition of "*Energy-efficient Labels and Standards: A Guidebook for Appliances, Equipment and Lighting.*"

The guidebook was designed as a manual for government officials, technical experts, and others around the world responsible for developing, implementing, and maintaining S&L programmes, as well as developing and designing the labels and standards themselves. It has become an invaluable reference for administrators of energy efficiency programmes around the world, sharing best practice S&L programme design.

As S&L programmes have expanded in response to demands for increased energy savings, they have faced many challenges, including the implementation of sets of procedures that ensure suppliers and products comply with programme rules. These procedures and their corresponding activities monitor, verify and enforce the regulations and rules of individual programmes – to maximise energy savings and to help safeguard the program's integrity, building the confidence of consumers and industry participants.

This **Guidebook on Best Practice Monitoring, Verification and Enforcement (MV&E) for Appliance Standards & Labelling** provides practical information on compliance frameworks based on the experiences of existing S&L programmes. It complements the previous guidebook and is designed as a manual for policy makers, programme administrators, and others involved in the design and implementation of S&L programmes worldwide.

It discusses the different approaches used to maintain compliance and describes the data, facilities, and institutional and human resources needed to support MV&E activities. It provides guidance on the issues to consider in the design and implementation of effective compliance regimes, and directs the reader to references and other relevant resources.

Finally, the guidebook demonstrates the importance of effective compliance regimes in safeguarding current and future energy and greenhouse gas emissions savings from S&L programmes. Government activity to improve compliance regimes ensures a level playing field for industry and to encourage greater levels of investment and innovation in energy efficient products.

Sincerely,

Christine Egan
CLASP Executive Director

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Glossary

Accreditation	Certification process by which the programme administrator ensures that testing facilities perform tests correctly with properly calibrated equipment.
Carbon Dioxide (CO2-e)	Colourless, odourless, non-combustible gas that is present in the atmosphere. Is one of the main greenhouse gasses – see 'Greenhouse Gas'.
CE marking	The initials affixed to a product, or where not possible to the packaging and to the accompanying documents, to show that it conforms to requirements specified in implementing measures under the EuP Directive. The CE marking must have a height of at least 5 mm.
Certification	The validation of performance by a third-party (i.e. not the product suppliers) in order to demonstrate that the product meets labelling or standards requirements, ensuring consistency, and giving credibility to claims about energy efficiency.
Check Testing	Taking a sample of products either from the factory floor or from the point of sale for independent laboratory testing.
Comparative Standards	Labels that present information allowing consumers to compare performance among similar products, either using discrete categories of performance or a continuous scale.
Compliance	Defined as the actions of a programme participant that are in accordance with programme requirements, even for voluntary programs (as the participant makes a commitment to any programme requirements - even if they're not legally binding).
Compliance Monitoring	Activities designed to collect information about compliance with the programme requirements. Usually monitoring is undertaken regularly throughout a standard or labelling programme's life (i.e. during programme implementation).
Compliance Regime	A comprehensive set of programme specific processes purposefully established to check conformity with all programme requirements, including facilitation and education; monitoring; market surveillance and verification; enforcement and reporting. Also including methodology to ensure errors are found and corrected and violations of requirements are returned to the permitted range or, if necessary, sanctions applied. It protects suppliers by making wilful non-compliance unacceptable.
Endorsement Labels	'Seals of approval' given according to a specified set of criteria.
Energy Efficiency Label	Informative labels affixed to manufactured products indicating energy performance that provides consumers with the necessary information to make informed purchase decisions.
Energy Performance	The characteristics of a product in respect to the energy or power it consumes under certain conditions.
Enforcement	The actions taken by an authority in response to incidents of non-compliance with the rules of a programme.
Enforcement Pyramid	Pyramid displaying six increasingly tough enforcement actions. Starting at the base of the pyramid with 'informal action' (such as letter and working though to 'prosecution' at the top.

Enforcement Regime	A structured set of actions used to remedy incidents of non-compliance that may include the establishment of a set of sanctions coupled with a progressive action plan for their application.
Entry Conditions	Describes a set of specific requirements that product suppliers need to meet in order to participate in either voluntary or mandatory standards and / or labelling programs.
Entry Requirements	See "Entry Conditions"
Evaluation	Assess the value of something, such as an energy efficiency programme.
Greenhouse Gas	Gases in the atmosphere that absorb and emit radiation within the thermal infrared range forming the fundamental cause of the greenhouse effect. The main greenhouse gases in the Earth's atmosphere are water vapour, carbon dioxide (CO_2-e), methane, nitrous oxide and ozone.
Harmonization	The adoption of the same test procedure or performance standard level or energy labelling criteria or design as that of an international organisation or trading partner or the mutual recognition of test results for a particular appliance through multilateral forum or compact.
Impact Evaluation	Assesses the energy and environmental impacts of a standards or labelling programme; can also assess cost effectiveness. Impact elements can include, influence of label on purchase decisions, tracking of sales weighted efficiency trends, energy and demand saving, pollutant emission reductions and other related effects.
Import Controls	A comprehensive set of programme specific processes purposefully established to check conformity with all programme requirements, including facilitation and education; monitoring; market surveillance and verification; enforcement and reporting. Also including methodology to ensure errors are found and corrected and violations of requirements are returned to the permitted range or, if necessary, sanctions applied. It protects suppliers by making wilful non-compliance unacceptable.
Laboratory Accreditation	The incorporation of national boarder control systems within the compliance framework of a programme, with respect to imported (and potentially exported) products. Customs authorities can provide data on the traffic in products and may alert import companies that products must meet national energy efficiency requirements. Authorities may also check that products are accompanied by any relevant shipment or import documentation, including information required to gain entry to the country and its appliance market (e.g. energy test reports).
Mandatory Programme	An energy efficiency programme in which participation is compulsory. There is no choice for suppliers about whether they participate.
Market Information	Type of entry condition requiring provision of sales or market penetration figures to programme administrator. This can be at time of entry to programme or it may be flagged at time of entry that the administrator may request this information at any time for delivery within a specified timeframe.
Market Surveillance	Those activities required to monitor compliance with programme conditions once products are in the marketplace. It does not include the taking of products from the marketplace for verification testing.

Glossary

Model	A specific unit or variety of a product.
Monitor	Observe and check that programme requirements are being met, either as a one-off or systematically, over a period of time.
Non-Compliance	Any instance deemed by the 'compliance regime' to be discordant with requirements of a programme.
Performance Standards	Prescriptions of minimal efficiencies (or maximum energy consumption) that manufacturers must achieve in order to be able to sell a product. The standard specifies energy performance but not the technology or design specifications for a product.
Private Reporting	Reporting on outcomes from monitoring, verification, enforcement and evaluation activities that shared only inside the programme administration body.
Process Evaluation	Measures how well a programme is functioning. Process elements include assessing consumer priorities in purchasing appliances, tracking consumer awareness levels, monitoring correct display of labels be retailers, measuring administrative efficiency and maintaining programme integrity.
Product	A category of appliance that is included, either voluntarily or mandatorily in an energy efficiency programme. A product may have a number of (product) models.
Product Information	A product information entry condition usually requires the submission of non-energy related product specifications such as model number, serial number, dimensions, weight, colour, along with other non-energy related information.
Programme	A scheme to promote improved energy efficiency in appliances and equipment.
Programme Administrator	The person or organisation responsible for running a programme.
Programme Participant	The body taking part in a programme, whether it is voluntary or mandatory. In the case of energy efficiency programs the participant usually refers to the 'supplier'
Public Reporting	Sharing the outcomes of monitoring, verification and enforcement activities with all, or selected external parties.
Regime	A system or planned way of doing things, the conditions or rules under which a process or programme happens
Self-Certification	See "Self-Declaration"
Self-Declaration	The statement made by a product supplier that stipulates the energy performance of a product. This statement may take the form of a written declaration, a certificate or a verification mark.
Stakeholder	Any party who may have an interest. Stakeholders typically include representatives of suppliers, consumers, utilities, local governments, environment and energy efficiency groups and representatives of importers and international organisations.
Standards and Labelling (S&L)	Energy efficiency programs for appliances and equipment that may be mandatory of voluntary, and include the specification of minimum energy performance standards (MEPS) or energy performance labels.

Supplier	Defined as a manufacturer, importer or wholesaler of appliances or products included in an energy efficiency programme.
Test	A laboratory procedure to determine one or more characteristics of a given product, according to a specified methodology.
Test Report	A report generated by the laboratory testing of a product that may be used to prove energy performance. Depending on programme requirements a test report may be required as an entry condition and can be generated either in-house by programme participants / suppliers or conducted by an independent laboratory.
Verification Testing	Verification testing in standards and labelling programs is used to prove the performance of a product with regard to its energy consumption in accordance with the specified test methodology. This can be done, depending on programme requirements, either independently, via a third party laboratory or in-house in the form of a 'self-test'.
Verification Mark	A visible indicator that is placed on an appliance to signify that it has been it meets relevant national standards (and potential conforms to other requirements).
Verification Regime	A verification regime is the process specified by the agency authorizing the standards and labels to determine whether the declared energy performance of equipment available on the market is accurate
Voluntary Programme	An energy efficiency programme in which product suppliers participate of their own free will. Participation is not required by law or regulation, it is a choice.

Glossary

Policy Makers Summary

Safeguarding the Success of S&L Programmes

As governments develop strategies in response to the challenges posed by climate change and the need to maintain secure energy resources, there is growing demand to build on successful energy efficiency initiatives, such as Standards and Labelling (S&L) programmes.

Despite considerable achievements to date, the potential exists for even greater energy savings from S&L in the future as markets and technologies develop. Appliances and equipment are being used by an increasing percent of the world's population, and new categories of energy consuming devices are appearing continually. Many of these product categories are largely untouched by existing energy efficiency policies (OECD/IEA, 2009).

In addition to broadening the scope of S&L programmes to cover more product categories, programme outcomes can be significantly increased at the implementation level. Establishing an effective compliance – or Monitoring, Verification, and Enforcement – regime is one key means of improving the impact of programmes, while also realising numerous co-benefits.

Achieving high rates of compliance has overall benefits for all stakeholders in the S&L process, as well as for the environment. Industry participants operate in a fair market that encourages investment and technological innovation, consumers benefit from reduced energy costs, and governments achieve key environmental and economic policy objectives.

Specifically, addressing compliance is important because:

- High compliance rates safeguard the investment made by governments by building up the credibility of their voluntary and mandatory energy labels;

- There is a corresponding risk that a failure to address issues of non-compliance can lead to serious long-term consequences through the erosion of consumer confidence. Instances of non-compliance, which can mean that consumers pay for performance that they do not receive, can seriously erode credibility. Once credibility is damaged, it requires a considerable effort to re-establish;

- High compliance rates also safeguard the investment made by compliant industry participants to manufacture and supply energy efficient products;

- Without adequate enforcement, the compliant industry participant is penalised through a loss of economic returns and competitive advantage, leading to a disincentive to invest in innovation;

- Improving compliance rates is likely to improve key outcomes from S&L programmes - more energy savings and reduced emissions of greenhouse gases, all of which will have been defined in existing S&L programmes but can only be truly verified through compliance activities;

- Understanding rates of compliance is a prerequisite to accurately measuring the outcomes of S&L programmes (energy savings and reduced greenhouse gas emissions).

These benefits and risks are summarised in the following figures:

Figure 1: The compliance circle
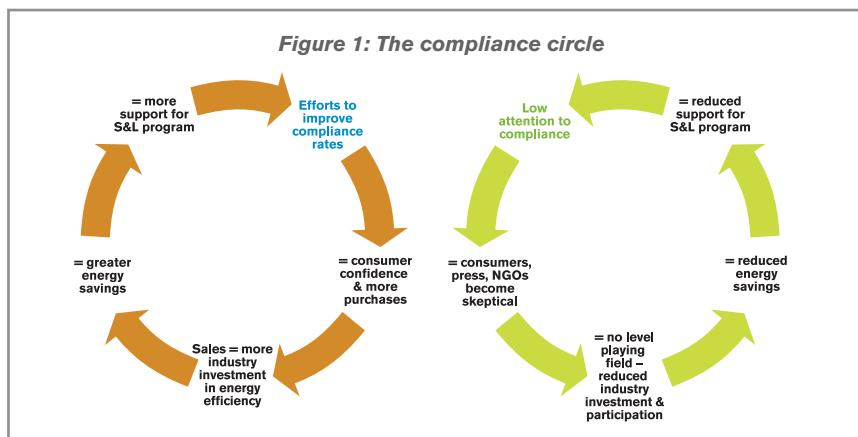
Planning for Compliance

Policy makers and S&L programme administrators can access the benefits of improved compliance rates and simultaneously manage the risks associated with low compliance rates, simply through greater attention to planning and implementing comprehensive compliance regimes.

Planning an effective compliance regime can occur at the time of initial programme design, or at any point during the life of an S&L programme, and can be implemented immediately or progressively depending on the availability of resources and other constraints.

Each S&L programme needs to develop a compliance regime that is appropriate for its circumstances, taking into account of its objectives, resources, legal framework, technical capacity, industry views and other factors that are programme or country specific. In considering options for compliance regimes, the exchange of information with national programmes in other countries regarding different approaches and experiences can help to better understand the associated advantages and disadvantages.

All compliance regimes should comprise of the following elements:

■ A well designed legal and administrative framework;

■ Processes to facilitate compliance, including a communication plan to educate stakeholders about their obligations;

■ A plan for monitoring and market surveillance;

■ Verification processes to ensure products perform as claimed;

■ Practical enforcement procedures that can respond rapidly to identified transgressions and include a range of appropriate sanctions;

■ A plan for communicating information and the results of compliance activities to stakeholders in order to build a culture of compliance and to highlight the risks of non-compliance;

■ Evaluation processes so that policy makers can assess programme outcomes, facilitate accountability of all participants, and guide improvements in programme design;

- A budget for compliance activities consistent with the declared ambition of the S&L programme.

As shown in **Figure 2**, these components are all interrelated. Selecting particular options will impact other choices and the distribution of the costs of compliance amongst governments, industry participants, and consumers. These linkages need to be understood to ensure that the overall regime is effective.

Figure 2: Overview of MV&E regime

Planning and Reviewing a MV&E regime
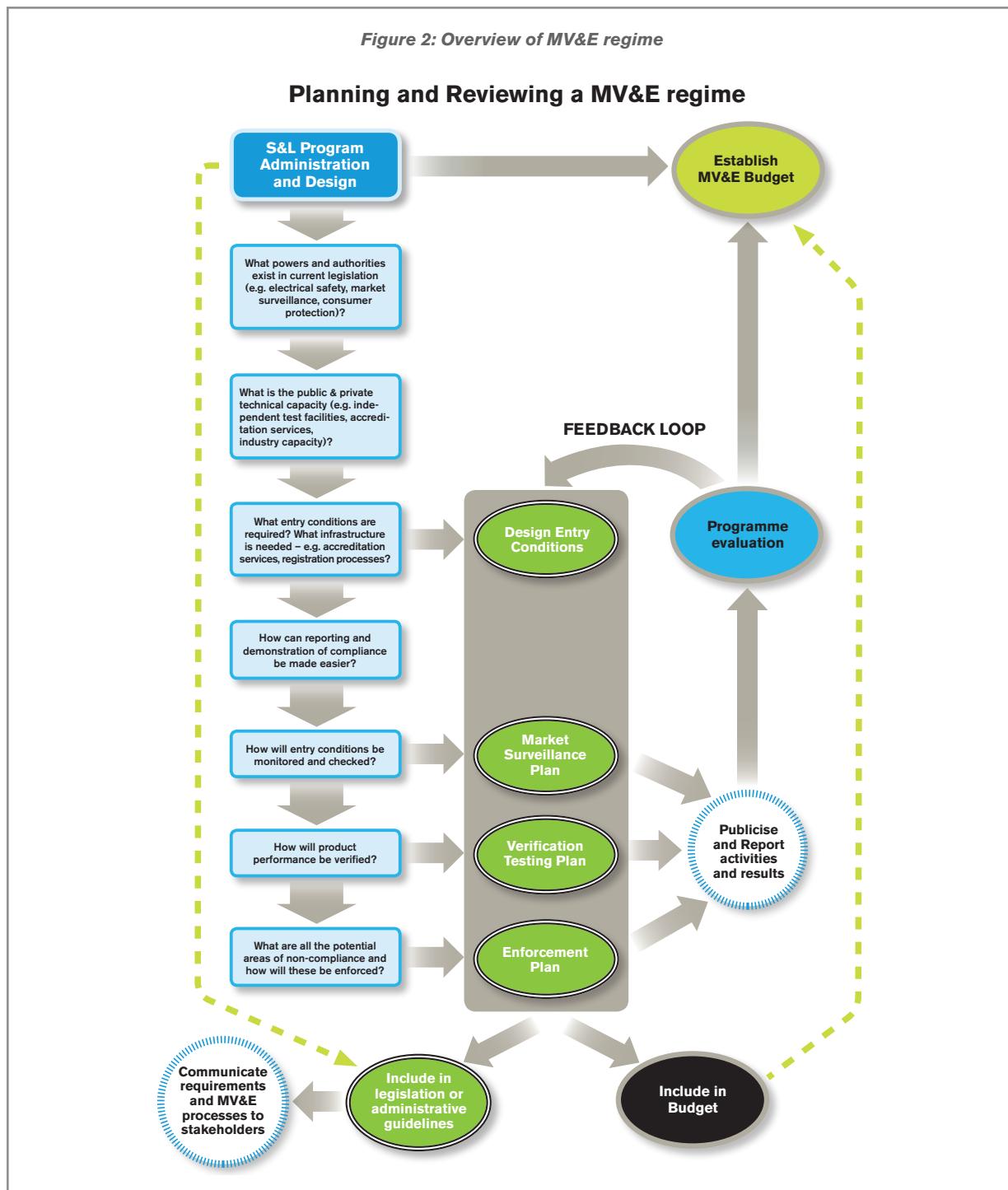
Providing the Appropriate Legal and Administrative Infrastructure

Compliance regimes need to be underpinned by a combination of legislation and administrative rules. An initial assessment of existing regulations and authorities is a first step to identify whether these are sufficient, require amendment or need to be supplemented by new legislation. Typically environmental, consumer protection, safety and copyright laws may be relevant.

Legislation for mandatory S&L programmes should include the definition and responsibilities of all participants, as well as the powers and sanctions needed to support effective compliance monitoring and enforcement. So too should consultation processes, public accountability and the reporting of outcomes. All programmes should have in place compliance regime policies, practices and procedures that are available to all participants to supplement the legal framework.

Resources and Cost Considerations

Investment in compliance and enforcement regimes is likely to be one of the most cost effective means to increase the environmental impact of S&L programmes in the short and long terms. There are substantial opportunities to minimise costs through the use of existing services, harmonising reporting requirements, and effective communication.

All compliance regime designs that deliver similar rates of compliance are likely to have similar overall costs. However, the costs may be distributed differently amongst governments, industry and consumers. The table below lists the three most common processes for the provision of information on product performance, which plays a substantial role in monitoring and enforcing the programme.

Table 1: Distribution of costs and benefits in an adequate compliance regime

Entry Condition	Distribution of Costs		
	Government/ Programme	Industry Participant	Consumers
In-house testing, calculation or self declaration allowed	High cost in market surveillance & verification testing	Low compliance costs	None
Independent tests required	Medium cost in market surveillance & verification testing	Medium initial compliance costs	May fund compliance costs in price of equipment
Third-party verification and/or certification required	Low cost in market surveillance & verification testing	High initial compliance costs	May fund compliance costs in price of equipment

Since each of these models allocates costs to stakeholders differently, a key factor in the choice of system is consideration of which is most equitable and feasible. Assess the pros and cons of each entry condition within context, since there is no one-size-fits-all solution.

Where programmes are designed with low compliance costs to industry, governments need to ensure that they maintain the public funding necessary to ensure the integrity of the programme.

Verification and Enforcement

A verification regime is the process specified by the standards and labels programme, sometimes in law, to determine whether the declared energy performance of equipment available on the market is accurate.

An enforcement strategy is a set of responses to incidents of non-compliance, coupled with a progressive action plan for their application that should include a range of elevating enforcement responses

Most programmes will need to undertake a review of technical capacity as part of their design of the Verification and Enforcement regime, taking into account the availability and level of competency of independent and industry testing facilities, and compliance and verification authorities.

- Whichever system is selected, governments need to ensure that the procedures used for verification tests are sufficiently accurate and robust to support any necessary enforcement action;

- Enforcement, including remediation, is most effective when action is timely, i.e. responding to the detection of transgressions without undue delay, and appropriate. Where sanctions are necessary, they should be sufficient to outweigh the benefits of non-compliance;

- All programmes should develop an enforcement strategy that includes a range of structured, elevating enforcement responses that can be implemented depending on the type of non-compliance and the responsiveness of the transgressor;

- To minimise costs and speed up response times, strategies should include remediation and informal processes and sanctions requiring low levels of proof. However, it is necessary for programmes to design a credible range of more stringent sanctions in order to raise the perception of risk.

Management and Staffing

Compliance regimes can be managed effectively by ensuring that responsibilities are clearly articulated and implemented, and that all legal processes and administrative procedures are applied. Attention needs to be given to maintaining readily accessible and structured records in order to support compliance activities, reporting and any potential enforcement action.

Considering the variety and level of expertise required to operate an effective compliance regime, governments need to invest in the appropriate training of staff and consider the use of external consultants or experts for specific functions. Staff requirements, in terms of numbers and skills, should be regularly assessed to account for changing demands as programmes develop.

Conclusion

This Guidebook delves deeper into each of the subjects covered above – and many more – in each of the following chapters. It can be read cover to cover for a crash-course in compliance topics, or used as a reference book.

1 Introduction

1.1 Standards & Labelling programmes in context

Energy efficiency plays a unique role in meeting some of the most pressing current key policy objectives: tackling climate change, promoting greater energy security, and stimulating economic development.

Policy measures in the end-use sector have already made significant progress in generating energy savings. Between 1973 and 2005, energy savings provided 58% of energy demand from the IEA 11[1] , making it the largest single contributor to meeting energy requirements for these countries (OECD/IEA, 2008).

Policies on appliances and equipment have contributed to these savings, especially in the electricity sector. The most widely used policy measure targeted at appliances and equipment has been mandatory and voluntary 'Standards and Labelling' programmes introduced to overcome barriers to the efficient allocation of economic resources. As noted in the CLASP Guidebook Ed.2:

> *"Well-designed mandatory energy-efficiency standards transform markets by removing inefficient products, with the intent of increasing the overall economic welfare of most consumers without seriously limiting their choice of products.*
>
> *"Energy labels empower consumers to make informed choices about the products they buy and to manage their energy bills" (CLASP, 2005).*

The successes of these programmes have been well documented. Over the life of these programmes, the unit energy consumption of many major household appliances has fallen dramatically in most economies, while at the same time products have increased in size, capacity and power.

At the same time as energy efficiency regulations have been implemented, appliance prices have also fallen in real terms, so consumers have benefited from both lower capital and running costs (IEA, 2007)(See Figure 3).

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1 IEA 11 comprises Australia, Denmark, Finland, France, Germany, Italy, Japan, Norway, Sweden, the United Kingdom and the United States. Source: OECD/IEA, 2008.

Figure 3: Recorded fall in average electricity consumption and prices for several
major appliance types in selected countries (IEA 2007)

Category	
Japan (A/c), 2001-2005	
United States (A/c), 1974-1993	
Australia (CW), 1993-2005	
Australia (CW), 1993-2005	
United States (CW),1983-2001	
Japan (Cold), 2001-2005	
UK (F), 1995-2000	
UK (Rf), 1995-2000	
Australia (F), 1993-2005	
Australia (Rf), 1993-2005	
United States (Cold), 1980-2001	

% Change

-70%   -60%   -50%   -40%   -30%   -20%   -10%   0%

■ Average Appliance Price   ■ Average Electricity Consumption

Key: A/c: Air conditioners; Cold: Refrigerators and freezers; CD: Clothes dryers;
F: Freezers; CW: Clothes washers; Rf: Refrigerators.

As a result of research conducted over many years, most energy policy analysts – such as the World
Energy Outlook - now conclude that:

> *"The most effective way of encouraging investment in energy-efficiency improvements
> is the well-designed and well-enforced regulations on efficiency standards, coupled
> with appropriate energy-pricing policies" (WEO, 2006).*

1.2 The future role of Standards & Labelling programmes

As governments develop strategies in response to the challenges posed by climate change and the need
to maintain secure energy resources, there is growing demand to build on successful energy efficiency
initiatives such as S&L programmes.

Even though significant improvements have already been achieved, the potential exists for even greater
energy savings in the future as markets and technologies develop. Appliances and equipment are being
used by an increasing percent of the world's population, and new categories of energy consuming

devices are continually appearing. Many of these product categories are largely untouched by existing energy efficiency policies (OECD/IEA, 2009).

As a result, it is estimated that the current technical potential to reduce energy consumption in equipment and appliances is between 20% and 40% (McKinsey, 2007a; OECD/IEA, 2003, 2006), with the majority of these savings delivered by currently available technologies (McKinsey, 2007b).

This analysis is reflected in the strategies considered by governments to meet their climate change policy objectives. As shown in **Figure 4**, it is widely agreed that end-use energy efficiency will contribute at least half of all savings in greenhouse gas emissions required to meet targets, such as stabilisation at 450 ppm by 2030[2].

Figure 4: Reductions in energy-related CO2 emissions in the IEA climate-policy scenarios (WEO, 2008)
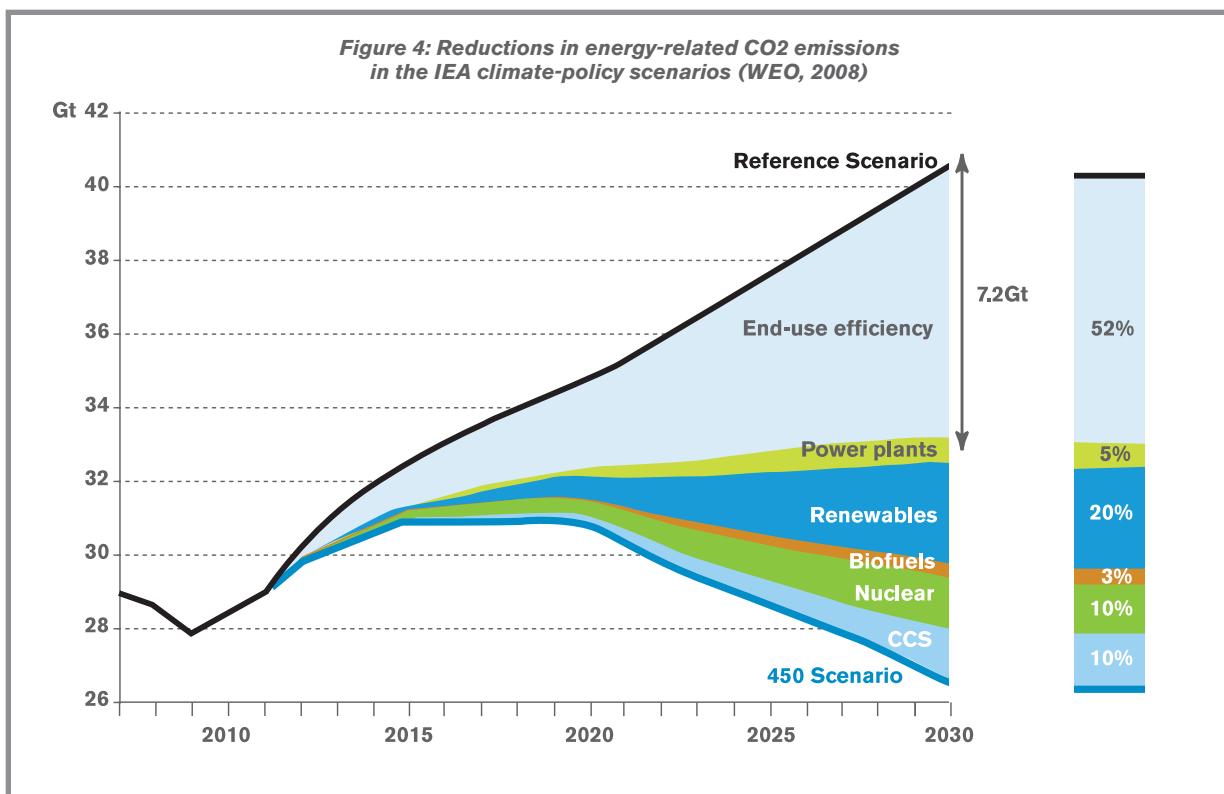
In view of their ability to stimulate markets for high efficiency products and provide opportunities for the next generation of efficient technologies, most governments around the world are therefore encouraging the expansion of their S&L programmes in order to have a greater impact.

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2   Estimated to be required to limit the global increase in temperature to c.2°C

Chapter 1 - Introduction

1.3 What is compliance?

In this Guidebook, **compliance is defined as the actions of a programme participant that are in accordance with programme requirements.** These requirements may be included in regulations and in the administrative rules of the S&L programme and span a range of obligations on participating organisations and products. For example, many programmes require conformity to processes such as the provision of information about the supplier and product, as well as the obligation for products to meet specified energy performance criteria.

The rate of compliance (or compliance rate) refers to the proportion of a set of products, typically all those within a programme, which are deemed to be compliant.

Compliance is an issue for all S&L programmes, both mandatory and voluntary. While suppliers are not required to participate in voluntary programmes, they are still bound by the rules of these programmes once committed, even if the rules are not legally binding.

Since many rules may apply to suppliers and products within S&L programmes, it is possible to find degrees of compliance. For example, a product within a labelling programme may meet the energy performance criteria but fail to display the label correctly. Existing S&L programmes vary in how they address different types of transgressions, but generally most recognise that some areas of non-compliance are more severe than others. Therefore, there is a set of proportionally matching responses. Overall data on compliance rates may vary depending on whether they refer to all programmes requirements, or to a subset.

In this Guidebook, reference is made to compliance regimes or frameworks; meaning sets of programme specific processes established to check conformity with programme requirements. Such processes include facilitation and education; monitoring, verification and enforcement (often abbreviated to MV&E); and reporting.

1.4 Why compliance is important

In addition to broadening the scope of S&L programmes to cover more product categories, programme outcomes can be significantly increased at the implementation level. This includes making criteria progressively more stringent, and ensuring that these thresholds are adhered to. The process of designing and implementing S&L programmes so that products comply with their criteria is the subject of this Guidebook.

Achieving high rates of compliance has overall benefits for all stakeholders as well as the environment. Programme participants operate in a market that is fair, constant and encourages investment and innovation in energy efficiency; programme administrators manage effective programmes which achieve their outcomes; consumers see reduced energy costs and improved products; and all stakeholders see a sustainable programme with strong integrity.

There are both short and long-term benefits from addressing compliance, together with substantial associated risks from not seeking compliance improvements:

- High compliance rates safeguard the investment made by governments in building up the credibility of their voluntary and mandatory energy labels;

- There is a corresponding risk that a failure to address issues of non-compliance can lead to serious long-term consequences through the erosion of consumer confidence. Instances of non-compliance, which can mean that consumers pay for performance that they do not receive, can seriously erode credibility; that will require a considerable effort to re-establish;

- High compliance rates also safeguard the investment made by compliant industry participants in order to manufacture and supply energy efficient products;

- Without adequate enforcement, the compliant industry participant is penalised through a loss of economic returns and competitive advantage, leading to a disincentive to invest in innovation;

- Improving compliance rates is likely to improve key outcomes from S&L programmes - greater energy savings and reduced emissions of greenhouse gases;

- Understanding rates of compliance is a prerequisite to accurately forecasting the outcomes of S&L programmes.

Developing and maintaining a strong compliance regime may appear overwhelming and resource intensive, given the scope of S&L programmes and the range of processes required. However, the benefits identified show that investment in compliance and enforcement regimes has a major impact on the success of programmes.

1.5 Purpose of this Guidebook

This Guidebook provides practical information on the design and implementation of compliance frameworks for mandatory and voluntary S&L programmes. It covers all aspects of effective compliance regimes, including the design of programmes, their legislative framework, entry conditions, monitoring and verification activities, and enforcement.

The Guidebook presents core concepts likely to be useful to:

- Officials responsible for the design, implementation, and operation of energy efficiency programmes;

- Representatives from industries involved in the manufacture, supply and retail of energy using products;

- Policy makers from the public and Non Governmental Organisation (NGO) sectors specialising in energy and environmental topics;

- Regulatory affairs officers and environmental regulators;

- Consultants and private sector companies in the fields of monitoring, verification and evaluation;

- Representatives from verification and certification companies.

Drawing on examples of the different approaches used by existing programmes around the world, this Guidebook uses a simple structured approach to address important questions facing policy makers, programme administrators, and technical experts, including:

- *What are the key components of a compliance regime?*

- *What are the important issues to consider in planning a compliance framework?*

- *How do different countries structure their compliance frameworks?*

- *What level of monitoring, verification and enforcement is necessary?*

- *Which other organisations and institutions can support a compliance regime?*

- *How can the cost of compliance be minimised for industry and governments?*

2 How to use this Guidebook

This Guidebook examines the processes used by mandatory and voluntary standards and labelling (S&L) programmes to ensure that the actions of a programme participant are in accordance with programme requirements. Compliance is an essential component of any S&L programme. Compliance enables energy programmes to achieve their goals; monitoring compliance enables programme administrators to assess the success of a programme.

This section describes the key elements of a compliance regime and provides an explanation of the terminology used in this Guidebook. A brief introduction to some of the key issues relating to each element is provided, and these are explored in-depth within their own individual chapters.

The processes designed to check compliance comprise several elements including:

- Facilitation of compliance;

- Monitoring (sometimes referred to as Market Surveillance);

- Verification;

- Enforcement.

These terms are explained more fully below. In this Guidebook, the activities designed to ensure compliance are abbreviated to "MV&E" - monitoring, verification and enforcement. A good system for ensuring compliance includes well thought out strategies for all of these elements; and therefore issues relating to the design and implementation of each element are examined in separate chapters within this Guidebook.

When combined into a system used by an S&L programme, these elements form an MV&E "regime". It should be noted that many elements within an MV&E regime are interrelated, so that the selection of particular options will impact on the capacity for enforcement, the legal framework, and the distribution of costs amongst governments, industry participants and consumers.

These linkages need to be understood to ensure that the overall regime is comprehensive and effective; the following diagram (**Figure 5**) explains these relationships. It highlights the issues that must be considered in planning an MV&E regime so that the final choice of tools and mechanisms to monitor and enforce compliance can be tailored to an individual programme.

To support these activities, it is extremely important that the MV&E regime also incorporates:

- A legal and administrative framework;

- A financial plan and budget; and

- A communication and reporting strategy.

These items are discussed further in **Chapter 3**.

> **An effective MV&E regime ensures that programme participants perceive the risks associated with non-compliance to outweigh the benefits.**

Figure 5: Overview of MV&E regime

Planning and Reviewing a MV&E regime

S&L Program Administration and Design → **Establish MV&E Budget**
CHAPTER 3

What powers and authorities exist in current legislation (e.g. electrical safety, market surveillance, consumer protection)?

What is the public & private technical capacity (e.g. independent test facilities, accreditation services, industry capacity)?

FEEDBACK LOOP

What entry conditions are required? What infrastructure is needed – e.g. accreditation services, registration processes? → **Design Entry Conditions**
CHAPTER 4

Programme evaluation
CHAPTER 8 & 9

How can reporting and demonstration of compliance be made easier?
CHAPTER 2

How will entry conditions be monitored and checked? → **Market Surveillance Plan**
CHAPTER 5

How will product performance be verified? → **Verification Testing Plan**

Publicise and Report activities and results
CHAPTER 3,5,6,7 & 8

What are all the potential areas of non-compliance and how will these be enforced? → **Enforcement Plan**
CHAPTER 7

Communicate requirements and MV&E processes to stakeholders
CHAPTER 3

Include in legislation or administrative guidelines
CHAPTER 3

Include in Budget
CHAPTER 3

2.1 Facilitating Compliance

> How can reporting and demonstration of compliance be made easier?

Taking steps to facilitate compliance is often overlooked, yet it is one of the least expensive and easiest ways to increase compliance rates. Common ways to facilitate compliance include:

- Communication and education;

- Provision of tools, training and guidance;

- Harmonisation of reporting functions.

These are described below and referred to throughout the Guidebook in relevant sections.

Compliance is not something that will just occur because a compliance regime exists; programme participants need to know about the existence of the programme and their individual responsibilities. This includes an understanding of the compliance regime and the administrative processes surrounding the monitoring and enforcement of compliance. Awareness-raising activities are essential to ensure maximum participation in both mandatory and voluntary programmes. See **Section 3.4**.

Since new participants and programme staff may join the programme at any time, this educational process needs to be continuous.

Facilitating compliance is about more than just communicating obligations. In designing programme rules, administrators should work with participants to ensure that the process of demonstrating compliance is clearly understood and feasible. This will also help to determine realistic timelines for implementation (See **Box 1**) and minimise the additional burden on participants while maintaining the necessary level of rigour.

This balance may be achieved, for example, by harmonising with other reporting requirements. The use of on-line tools may also help suppliers to provide information at least cost.

Programme administrators also need to consider whether participants have the appropriate skills and technical resources necessary to comply. Where these are shown to be lacking, the provision of specific training, guidance notes, briefings and clearly identified sources of information will help to increase the likelihood of compliance.

2.2 Monitoring

Market Surveillance Plan

Design Entry Conditions

Monitoring comprises the collection and analysis of data to give an accurate picture of programme progress and compliance, and is usually an on-going process. It provides the opportunity to identify and act on any implementation issues, as well as providing data for programme evaluation.

Most programmes will need to monitor a range of requirements to be able to determine whether all the rules of the programme are being met. In this Guidebook, the requirements to provide information when a product supplier joins the programme or offers specified models for sale under the programme are referred to as Entry Conditions (See Chapter 4). Compliance monitoring that occurs once a particular product is in the retail (or wholesale) marketplace is known as Market Surveillance (See Chapter 5).

Since most programmes place different obligations on participants, there is no list of monitoring activities common to all programmes; however the design of Entry Conditions and Market Surveillance activities needs to be adequate to track compliance with all the requirements of a particular programme. These do not always relate directly to energy performance, but also to processes that help to ensure the integrity of the programme; such as whether the right information has been provided by suppliers, or if labels are being placed on products correctly.

2.3 Verification

**Verification
Testing Plan**

Verification is the process of determining whether a product actually performs according to its claimed energy performance value. Whether product suppliers report the energy performance of their products on entry to the programme, or declare them through an energy label or by some other means, the risk of false or inaccurate declarations of product energy performance is reduced through verification testing.

Verification testing checks whether the claims made for the energy performance of individual products by their suppliers are accurate under the conditions stipulated in the programme rules. **Chapter 6** details the necessary considerations of verification testing, such as the capacity requirements of testing laboratories, level of competency, and number of tests for each type of product.

2.4 Enforcement

**Enforcement
Plan**

When developing a programme it is essential to consider not only how non-compliance will be detected, but also how it will be responded to and by whom. Enforcement is about responding to non-compliance offences with a suite of timely and appropriate actions and **Section 7.3** lists the programme administrators' important considerations in planning the enforcement regime.

When instances of non-compliance are not responded to as often or as appropriately as they should be, there are negative repercussions on the energy efficiency programme's integrity. If programme participants see that the penalties for non-compliance are low, then there is less motivation for them to comply, particularly if the costs of compliance are seen to be high.

Programme administrators should consider the design and implementation of procedures for responding to non-compliance offences. These procedures or strategies may include a suite or hierarchy of planned, elevating responses, and provide multiple opportunities for the offender to admit or rectify the non-compliance. See **Chapter 7**.

3 The Establishment and Operation of MV&E regimes
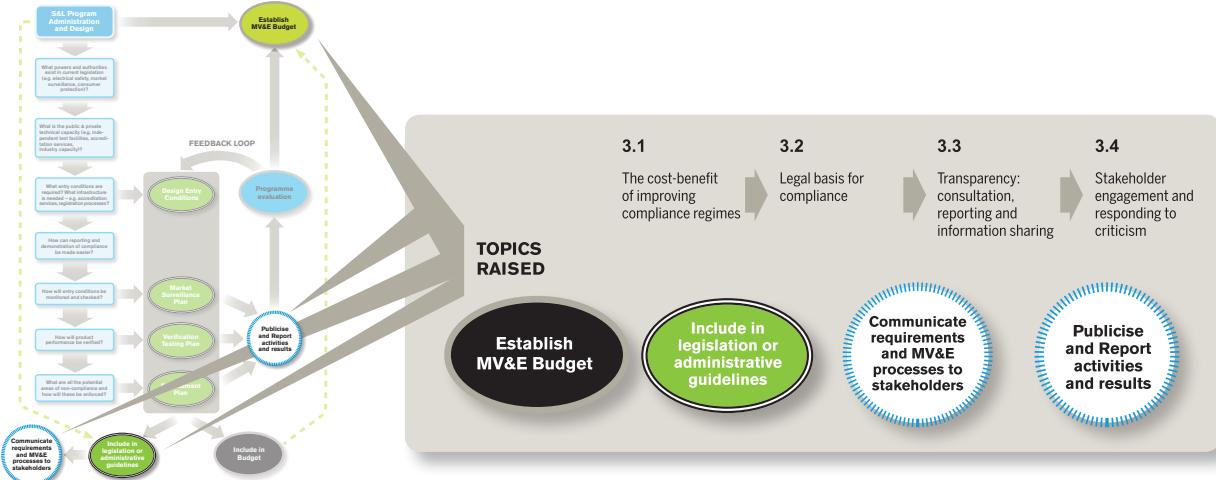
An MV&E regime will only be successful if the programme participants perceive that the risks associated with non-compliance outweigh the benefits. This is particularly true for those industry players who might have otherwise been tempted to place on the market or register under the S&L programme non-compliant products. The various types of non-compliance are further discussed in **Section 7.2**.

MV&E activities are likely to result in high compliance rates if potentially fraudulent participants are deterred by the risk of being caught. Moreover, a culture of compliance should be established within the given S&L programme. This requires a carefully planned, adequately resourced, and well communicated MV&E regime, starting with the identification of all potential areas of non-compliance.

Several alternative frameworks for compliance regimes and discussions on the various components within a regime are detailed in this Guidebook. Information exchanges on different MV&E approaches and experiences are also extremely useful in helping programme administrators better understand the advantages and disadvantages of all the options available to them. However, each regime is unique and needs to take account of its objectives, resources, legal framework, technical capacity, industry views and any other factors that may be programme or country specific.

The following elements, discussed below and referred to throughout the Guidebook, need to be considered in order to build a practical and appropriate MV&E framework:

- Whether the S&L programme is mandatory or voluntary; see **Section 3.1**

- The cost-benefit of improving compliance regimes; see **Section 3.2.1**

- Major costs for the MV&E component of S&L programmes; see **Section 3.2.3**

- Legislative powers for monitoring, verification and enforcement; see **Sections 3.3** & **7.3**

- Transparency: consultation, reporting and information sharing; see **Section 3.4**.

3.1 Mandatory and voluntary programmes

All national minimum energy performance standards (MEPS) and mandatory labelling programmes are established through legislation which provides the institutional framework and sets the necessary powers for the S&L programmes to operate. See **Section 3.3**.

 Typically these regulations strictly define and prescribe the requirements for product suppliers and the scope of products covered, sometimes through reference to other legislation and standards. For those programmes where participants are under obligation to comply with minimum standards or to display a label to lawfully sell their products, for example, the regulator will include explicit provisions for MV&E related activities within the legislation. These provisions may be fairly basic and are frequently supplemented in greater detail by administrative guidelines. However the compliance guidelines are communicated, compliance for mandatory programs is mandatory.

But while many voluntary S&L programmes will also have a legal foundation, operational aspects are often described in less formal documents. Compliance may sometimes be overlooked in a bid to attract more participants or because the administrator is not aware of the benefits of developing and maintaining a strong compliance regime (See **Section 1.3**).

However, while mandatory and voluntary programmes stem from very different

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BOX 2: ENERGY STAR ENHANCED TESTING AND VERIFICATION PLAN

Following a thorough review, the US EPA ENERGY STAR programme has launched several new initiatives to improve its compliance regime.

The first step has involved clarifying roles and responsibilities, with the DOE taking the lead in product verification testing and ENERGY STAR looking after qualification testing.

New processes to be adopted for qualification and verification testing include:

- All products will be required to supply supporting evidence of compliance with the relevant criteria before being able to use the label. This evidence will include test results from an accredited laboratory. Currently most products are able to carry a label for a period of up to one year prior to submitting the supporting evidence.

- The development of a list of accredited laboratories that can perform qualification and verification tests.

- The use of third-party verification and manufacture-funded verification testing in qualified laboratories, to compliment the governments testing of products 'off the shelf'.

- In addition, ENERGY STAR will publish a standard protocol for responding to product testing failures.

The new process also includes a larger role for sharing information on compliance activity with stakeholders, with the EPA noting that:

"Verification testing should be conducted in a transparent manner, plans and results should be shared in various forms to meet needs of specific product categories" (EPA, 2010).

As a result, it is proposed that the following information will be provided to stakeholders:

- US government and partner countries
  - A list of products tested each year with a summary of test results
  - Detailed test reports for products that fail testing
- Retailers and energy efficiency programme sponsors
  - The total number of models tested
  - Delisted models
  - Models that failed, but not delisted, including reason for not delisting
- General public
  - Annual summary of testing, including the total number of products tested and the number of models delisted.
  - Post failed and delisted products

mandates, careful planning and budgeting is a core element of the compliance regimes for both types of programmes. So too is the need to maintain readily accessible and structured records of market surveillance, verification and enforcement actions. However, programme administrators will be making different communication choices and are likely to treat enforcement actions differently; especially with regards to the speed and stringency of remedial actions, with mandatory programmes seeking prosecution as an ultimate penalty.

The following figure illustrates the areas where mandatory and voluntary programmes may differ in their approaches to compliance, and identifies elements that are likely to be common to both types of programme.

Figure 6: Planning a MV&E regime for mandatory and voluntary S&L programmes

Legal basis of compliance activities

- Regulatory basis incl. Enforcement powers and procedures (Public consultation undertaken)

- Scheme's rules or equivalent adopted. Participants are required to sign/agree to those prior to entry and are notified of any changes made

Who is responsible

- Market Surveillance Authority/ Responsible Entity (Coordinate on with the legal enforcer is essential when delegating powers. SLA can be envisaged

- Programme administrator with sometimes the help of a Steering group, Programme Board or Panel

Planning and budgeting

- Budget allocations
- Forward planning and internal procedures
- Input from product and experts and lawyers
- Collaboration with testing laboratories

Information on sharing and Monitoring & Reporting

- Guidance for suppliers to be aware of their obligations
- MoU with relevant bodies
- Maintain records of M,V&E
- Publication of compliance rates

- Regular contacts with participants updates
- Maintain records of M,V&E
- Publication of compliance rates (only if other participants agree)

Enforcement

- Informal action
- Compliance advice letter
- Failure to comply letter
- Letter of warning
- Settlement
- Prosecution

- Slower level of escalation of the enforcement pyramid, which does not go beyond settlement

Mandatory compliance program
Voluntary compliance program
Common key elements

3.2 MV&E Budget and Financial Considerations

Establish MV&E Budget

When planning for MV&E, one of the first questions to consider is how much funding is available to dedicate to compliance activities. This question cannot be addressed in isolation. The answer will vary greatly depending on the design of the MV&E regime, its entry conditions (See **Chapter 4**), and, most

importantly, what how much the government is willing to invest to ensure that the desired S&L programme targets are met. While higher levels of expenditure are likely to deliver higher compliance rates there are many ways to reduce costs through good design and planning, and maximising communication. These are discussed throughout the Guidebook.

Another key consideration is the distribution of costs between the different participants discussed in Sections 3.2.2 and 4.1, which vary considerably depending on the design of the MV&E regime. Details of the major costs for the MV&E component of S&L programmes are given in Section 3.2.3.

3.2.1 The cost-benefit of improving compliance regimes

Understanding the costs and benefits associated with MV&E regimes is important:

- For governments to justify decisions on the design of programmes to industry partners;

- For programme administrators to articulate requests for adequate public funding of MV&E processes;

- To gain support for the programme from consumers and consumer groups.

Generally MV&E regimes that deliver high rates of compliance will have a higher overall cost than those that achieve lesser outcomes. This is true irrespective of the regime design, although the design is likely to affect how these costs are distributed amongst governments, industry and consumers, as discussed below.

It is often assumed that businesses will always prefer lower cost compliance options and that consumers will always prefer more beneficial options. However, both business and consumers may accept higher cost options if they can be convinced that:

- Lower cost options would be ineffective;

- Higher benefit options would impose disproportionate costs; or

- Higher costs in the short to medium term are likely to be offset by higher benefits in the longer term; for example by enabling access to new markets, or safeguarding programme integrity and industry investment.

Not only will the overall costs of an MV&E regime vary depending on the scope of each programme, but also on a range of local factors, such as cost structures and labour costs. However, it is relatively easy for programmes to determine the value of investing in compliance activities by estimating the savings in energy expenditure resulting from increase compliance rates. An example of this type of calculation is shown in Box 3, which demonstrates major investment in MV&E regimes is extremely cost-effective.

BOX 3: CALCULATING THE COST OF NON-COMPLIANCE

Based on the results of tests conducted on a random sample of refrigerators, a programme finds that on average, refrigerators exceed MEPS levels by 2%.

If we assume there are approximately 500,000 new refrigerators sold in this market every year, and each consume an average of 550kWh, then these products will cost consumers a total of USD 50,000 in higher energy bills for every year they operate.

This means that a single year of non-compliance at this level will result in an additional USD 600,000 paid by consumers.

This calculation only includes the value of lost energy savings, and would increase if the costs associated with greenhouse gas emissions were added.

Expanding this to cover all products covered by an S&L programme indicates the extremely high levels of return that flow from investment in an effective MV&E regime.

3.2.2 The distribution of costs and benefits

Compliance costs and benefits fall to different participants, depending on whether there are high or low compliance rates within an S&L programme. This is illustrated in the following example.

Scenario 1: The inadequate compliance regime

In this scenario, there is a low level of attention to MV&E activities by the government, and this is reflected in low rates of compliance amongst industry participants. In a competitive market with low compliance, it is unlikely that energy efficiency features will be able to command a premium price (at least sustainably), since compliant products will compete with products which have had less investment and are therefore likely to be cheaper.

The costs and benefits to stakeholders in this scenario are summarised in the following table.

Table 2: Distribution of costs and benefits in an inadequate compliance regime

Inadequate Compliance Regime		
Stakeholder	**Costs**	**Benefits**
Government/Programme management	Failure to reach programme targets	None
Compliant Industry Participant	Lack of economic return from investment in new technology Inability to pass on compliance costs to consumers Unable to access markets in jurisdictions with high energy efficiency standards	Low investment in technology Low compliance costs
Non-compliant Industry Participant	Unable to access markets in jurisdictions with high energy efficiency standards	Low investment in technology Low compliance costs

From this, it should be noted that:

■ Consumers may experience short-term benefits from non-compliance through lower prices for equipment (albeit for inferior products). However, they may also pay a premium for equipment that they expect to be more energy efficient than it is;

■ There are likely to be significant commercial benefits to suppliers of non-compliant products through lower product production and avoidance of their own 'corporate compliance programme' costs;

■ Non-compliance breeds non-compliance. That is, when non-compliance is prevalent, there are more cases to investigate and some strong action is required to communicate to programme stakeholders that the administrator is (or has become) serious about compliance;

- The costs of compliance may be borne by particular groups of consumers when non-compliance is not uniform across the market. For example, if there are more non-compliant products at the lower price end of the market, the long-term energy costs (or lack of benefit) will fall on lower income consumers.

Therefore, in a market with high levels of non-compliance, the only real beneficiaries are the suppliers of non-compliant products. As suppliers grow to recognise that compliance is not adequately enforced, the incentive towards non-compliance grows stronger, even amongst those suppliers who support the aims of the programme.

Scenario 2: The improved compliance regime

In this scenario, the MV&E regime is assumed to be effectively implemented by government, and this is reflected by high rates of compliance amongst industry participants. In a fair, well-informed, and competitive market, any additional investment required to meet energy efficiency criteria, together with the cost of compliance, is able to be passed on to consumers.

The costs and benefits to stakeholders in this scenario are summarised in the following table.

Table 3: Distribution of costs and benefits in an adequate compliance regime

Improved Compliance Regime		
Stakeholder	**Costs**	**Benefits**
Government/Programme management	Higher MV&E expenditure	Attainment of programme targets
Compliant Industry Participant	Higher compliance costs Higher investment required in new technology	Products priced at a premium Economic return on investment Access to new markets in jurisdictions with high energy efficiency standards
Non-compliant Industry Participant	High risk of sanctions at least equal to the economic benefits	Products priced at a premium Economic return on investment Access to new markets in jurisdictions with high energy efficiency standards

From this, it should be noted that:

- The benefits of compliance to the administrator are not economic; they represent attainment of its institutional objectives (environmental benefits) for society and, through that, the enhancement of consumer welfare;

- Consumers may face higher up-front capital costs for equipment (reflecting levels of investment and compliance costs), but these will be offset by assurance of lower energy

bills. In reality, the costs of efficiency are often small or negligible and can be minimised by planning (IEA, 2007), leading to greater economic returns to consumers;

- Even if incidences of non-compliance are low, government expenditure will still be needed to ensure a fair and informed market. In dynamic markets with new entrants, often from foreign markets, compliance cannot be assumed and continued vigilance is required;

- The establishment of a 'compliance culture' is likely to reduce costs to governments over time, as the need for high levels of verification and more serious enforcement action is reduced;

- In this scenario, where there is a high risk that non-compliance will be detected, the costs to transgressors will include loss of reputation, denial of access to markets, the costs of any sanctions imposed, and the costs of responding to an investigation and litigation;

- If non-compliance is low, compliance costs will be similar for each programme participant. Governments can minimise these costs by facilitating awareness of programme requirements through educational activities, by resolving non-compliance at the lowest appropriate level and in a timely fashion, and by providing guidance on effective corporate compliance strategies.

Therefore, although overall costs are likely higher in a properly functioning market with high rates of compliance, both the costs and benefits are spread across all participants.

3.2.3 Costs and budgeting

As noted above, investment in a robust MV&E regime is highly cost-effective and important to protect the integrity of S&L programmes. It is essential for the success of any programme to secure and maintain the funding necessary to carry out all relevant compliance activities, and therefore best practice is for MV&E to have a distinct annual budget allocation.

Typically the major costs for the MV&E component of S&L programmes will include:

- **Establishment costs** including initial awareness-raising campaigns. Designing a compliance programme can attract significant costs, particularly if the help of legal advisors and other experts is required to ensure that the programme is sound and fits within the appropriate legal framework. Investment in information and tracking systems early on will contribute towards better programme management and lower costs in the long run. Very often compliance programmes will start their activities with a gentle phase-in period, focusing on informing participants and the public about the aims of the programme and how non-compliance will be addressed. The programme administrator should concentrate on capacity building and establish contracts with relevant third-parties as needed (e.g. testing laboratories, product experts etc.) to ensure that compliance activities run smoothly from the start.

- **Management and administrative staff, information technology, and communication.** Providing and adequately training the necessary level of staffing to manage and administer the MV&E component of S&L programmes can have substantial costs. Often

several programme staff will undertake specific MV&E tasks alongside other functions as part of their workload, which can be an effective way of matching skills. Using external expertise can often be an efficient way of increasing the in-house skill-base through on the job training, as well as protecting against claims of bias in some circumstances. Clear allocation of management responsibilities and a high level of co-ordination and communication to or amongst staff, consultants, additional experts, and program participants are vital to ensuring that non-compliance is detected and enforcement action is supported. Comprehensive IT support is essential to almost every operational area within a modern administration.

- **Monitoring costs and verification testing (in-house or external).** Most administrators must rely on either government operated or private sector laboratories or other testing facilities whose management is outside the day-to-day control of the administrator. This independence may add credibility to test results. However the absence of control makes it more difficult to ensure appropriate standards are maintained and that the administrator's priorities are reflected. Establishing detailed Service Level Agreements (SLA) is one way of addressing this control issue.

- **Legal advice, representation and costs linked to enforcement action.** A successful administrator will have sufficient funding to allow the use of the full range of enforcement responses. If programme participants perceive that the administrator's funding significantly impedes its discretion to use high-end responses, then the credibility of the MV&E regime will be diminished.

- **Additional factors.** There are many other factors that affect costs, as well as opportunities to minimise them (See **Section 2.1**). While these issues are considered further in regard to specific elements of a compliance regime in the following chapters, seeking the help and guidance of sister energy efficiency programmes is a useful first step. Staff secondments and exchanges (in both directions) can quickly build internal expertise, and sister administrators may be able to offer assistance, by showcasing their own IT systems as a guide, or even by allowing the licensing of their applications at a reasonable cost.

3.3 Legal basis for compliance

Include in legislation or administrative guidelines

The legislation that underpins an S&L programme is an important component of its MV&E framework, combined with administrative guidelines and other, less formal documents to define the responsibilities of the various participants, and to provide the authority, powers and sanctions for enforcement.

Compliance measures within the legislative framework for an S&L programme need to be included with

reference to the existing legislative and institutional environment of a country, in order to ensure that there are no contradictory requirements or potentials for confusion. This issue is discussed further in **Section 7.3.3**.

As shown in **Box 4**, **5** and **6**, legislative arrangements for each programme depend upon the governance structure of the country, existing legislation and infrastructure and the design of the MV&E process. However, although the details differ, the following major areas all need to be considered as potentially relevant for inclusion in either legislation of additional programme 'rules':

Definitions and responsibilities, e.g.:

- To whom does the legislation apply exactly?

- Which person or authority is responsible for undertaking specific actions under the legislation?

The establishment/identification of key institutions, e.g.:

- Certification authorities;

- Monitoring and market surveillance organisations.

BOX 4: MV&E RESPONSIBILITIES DEFINED IN EU ECODESIGN DIRECTIVE (EU, 2005)

The Framework Directive for the Ecodesign of Energy Using Products (EuP) came into force in 2005. It provides a legal framework for establishing minimum Ecodesign requirements for energy using products by defining conditions and criteria for setting such requirements through subsequent implementing measures. Since October 2009, its scope has been widened to include energy related products. These implementing measures are targeted at individual product groups such as white goods, motors, televisions or lighting equipment. Once approved as European Regulations, the implementing measures do not need to be transposed into national legislation.

The Framework Directive requires Member States to put in place a Market Surveillance Authority (MSA), which has powers to carry out checks on products, request relevant information from manufacturers, and request the withdrawal from the market of non compliant products. It also requires that penalties shall be "effective, proportionate and dissuasive, taking into account the extent of non compliance and the number of units of non-complying products placed on the Community market".

Specifically, the Directive states that:

'Member States shall take all appropriate measures to ensure that products 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.

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 to:

- organise appropriate checks on product compliance, on an adequate scale, and oblige the manufacturer or its authorised representative to recall non-compliant products from the market in accordance with Article 7;

- require the parties concerned to provide all necessary information, as specified in the implementing measures;

- take samples of products and subject them to compliance checks.

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.

Member States shall ensure that consumers and other interested parties are given an opportunity to submit observations on product compliance to the competent authorities.'

**BOX 5: S&L REGULATORY SYSTEM UNDER
AUSTRALIA'S FEDERAL GOVERNANCE STRUCTURE**

Australia is a federal system of governance comprising the Commonwealth, State and Territory governments. MEPS and mandatory labelling are enacted in State law. For example, in the largest State of New South Wales, MEPS and mandatory labelling are enacted through the Energy and Utilities Administration Regulation 2006 (updated 2009), under the Energy and Utilities Administration Act 1987 (NSW, 2006; NSW, 2009).

These regulations require all products within the scope of energy efficiency regulations to be registered with one of the State-based regulators prior to being sold within Australia. The registration process requires the lodgement of details about the supplier and the product, including its energy performance.

The information and evidence of energy performance required is common to all regulators, as is stipulated in the relevant Australian (or joint Australian and New Zealand) standard for each product.

In addition, the regulation provides the regulator with the authority to examine or test any product and/or require the supplier to provide samples for testing within 15 days.

Sanctions under the regulation include financial penalties and deregulation (once a product is deregulated it cannot be sold in Australia). A fine of $550 can be made for each offence where a product is sold without an appropriate energy label displayed. This fine is imposed for each and every model where an offence is found and is imposed on the person responsible for selling the product.

The Government also has the power to cancel the registration if the energy performance of a model is found to differ from the registration details or the energy label, or does not meet the criteria in the relevant standard. Deregistration can also occur where the supplier engages in conduct which misleads or is likely to mislead the public as to the physical characteristics, energy efficiency or performance characteristics of the equipment.

When a model is deregistered, the Government has the powers to deregister other similar products if there is evidence of similar offences.

The regulation stipulates that a supplier must be given 15 days to respond to the Government's proposal to deregister a product with written reasons why this should not occur. If the appeal is not upheld, a further five days notice is required before the cancellation of registration

In addition to penalties understate legislation, false representations by a supplier of a product's performance or energy efficiency may also constitute offences under the Trade Practice Act of Australia, enforced by the Australian Competition and Consumer Commission (ACCC). In recent years, several offences have been referred to the ACCC which has secured court enforceable undertakings for a number of remedial actions by suppliers of non-compliant products (Commonwealth of Australia, 2008).

The establishment of key processes, e.g.:

- ■ Product registration;

- ■ The requirement to use verification marks on products;

- ■ The process of gaining certification;

- ■ Particular requirements relating to border controls for imported products.

Requirements on product suppliers, e.g.:

- ■ To meet the energy performance requirements specified;

- ■ To provide information and evidence in support of claimed performance;

- ■ To submit products for verification testing;

- ■ To provide sales information.

The provision of enforcement powers, e.g.:

- The ability to impose sanctions where instances of non-compliance are found;

- The identification of to whom these sanctions apply;

- The level or range of financial penalties applicable;

- Any relevant appeals process.

Requirements on other stakeholders, e.g.:

- On retailers to display labelled products;

- On retailers to train staff.

Budgetary issues, e.g.:

- The requirement to allocate a specific budget for adequate compliance activity;

- Any fees required for participation in the programme;

- Any contributions to testing costs, etc, required of participants or groups of participants.

Levels of Compliance activity, e.g.:

- Specified minimum levels of market surveillance, e.g. X% of products covered by the programme;

- Specified minimum levels of verification testing, e.g. X% of products covered by the programme.

Transparency, e.g.:

- The requirement to publish information on a regular basis covering;

- Expenditure on compliance activities;

- Level of monitoring and verification activity;

- The results of these compliance activities.

BOX 6: MEXICO'S MV&E REGIME

Mexico's mandate for energy efficiency standards comes from a generic law, la Ley Federal Sobre Metrología y Normalización of July 16th, 1992, which establishes a set of specific and generic public and private organizations to implement the S&L programme.

Public

- National Standardization Commission: to coordinate standardization activities at a national level
- National standards advisory committee: committee for energy efficiency standards chaired by Conuee
- Secretary of Economy: General Direction of Standards approves testing laboratories.
- National Metrology Center: primary calibration laboratory.

Private

- Accreditation entities: ensure the technical competence of certification organisations, testing laboratories, calibration laboratories, and verification units - the Entidad Mexicana de Acreditación (EMA)
- Certification organizations: approved by corresponding ministries to certify compliance with standards – the Asociación de Normalización y Certificación, A.C. (ANCE)
- Testing laboratories: either independent or operated by manufacturers.
- Verification Units
- Calibration laboratories

The relationship between these bodies is shown below:
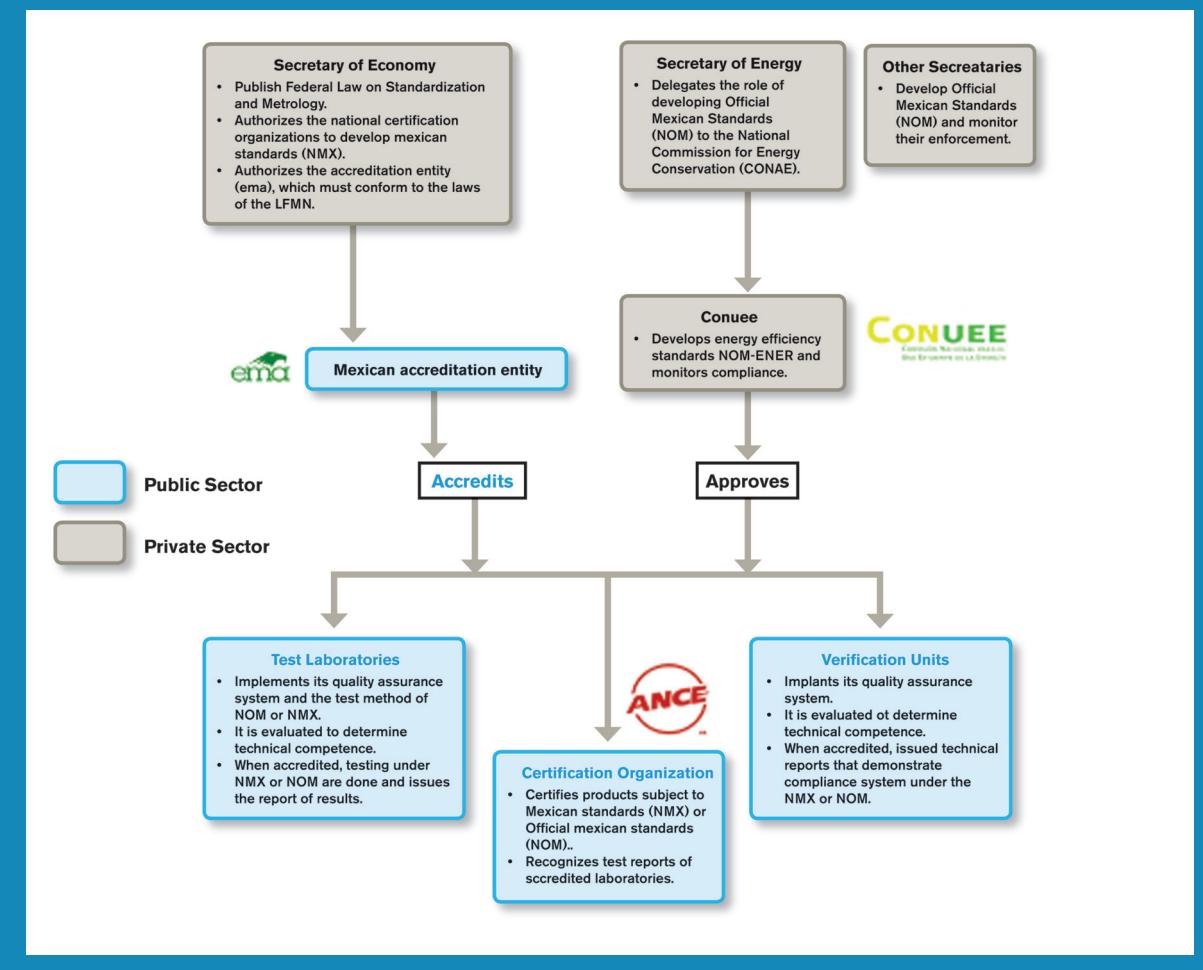
3.3.1 What should be legislated?

It is important that the 'rules' of each compliance programme are comprehensive and transparent, whether these are contained in legislation, guidelines, or other documents.

The inclusion of all compliance-related processes within legislation provides regulatory certainty to industry and ensures transparency. However, this approach may reduce operational flexibility or require the frequent updating of legislation, which can be time-consuming. The same results may be better achieved by using a mixture of legislation and less formal programme rules.

Legislation should be used to identify the key components of the compliance framework, and to provide the necessary powers and authorities to undertake compliance monitoring and enforcement. Items which may be subject to change over time should be clearly laid out in documents provided by the programme and made available to participants.

For example, programme legislation might include the requirement for products to be certified by an independent third-party before they can be sold. However, rather than naming specific certification agencies (which may change over time), the legislation should make reference to an external list of eligible agencies, which is assembled by the programme administrator, regularly distributed, and easily updated.

Similarly, programme administrators may want to ensure adequate monitoring and verification by including in the legislation the requirement to regularly publish the details of compliance expenditure, levels of activity undertaken, and the summary of outcomes of MV&E work, rather than specifying minimum levels for these activities within the legislation itself.

3.3.2 Definitions and responsibilities

Within most S&L programmes, many legal requirements are placed on product suppliers. However, with the growth in global trade and other supply chain changes, it is important that these are appropriately defined to capture all potential sources. Typically suppliers of products include both local and overseas manufacturers and import companies, but in most countries it is also appropriate to include new products offered for lease or hire.

Direct sales to end-users over the internet have grown substantially in recent years, and this channel must now be included within the scope of S&L programmes. For example, programme rules need to apply to products which are sold directly to the end-user from an overseas supplier, omitting a retailer or importer, and the requirements for displaying product labels on sales websites need to be clarified.

In some countries, obligations are also placed on retailers or wholesalers (for example, to ensure products display labels), and these must be clearly defined within legislation and/or administrative guidelines. Requirements for retailers can be a useful addition to supplier obligations, since transgressions can be readily spotted through market surveillance (See **Chapter 5**). It is also easier to identify the responsible retailer, which is not always the case for suppliers, thus simplifying the task of following up with enforcement actions (See **Chapter 7**).

3.4 Transparency: consultation, reporting and information sharing

Communicate requirements and MV&E processes to stakeholders

Publicise and Report activities and results
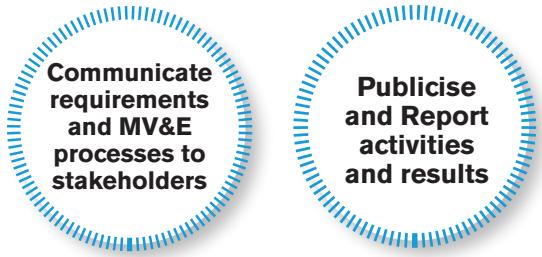
Public reporting is vital to elevating the profile of compliance activities and increasing perceived risks of non-compliance, and can also provide an important sanction as part of the enforcement process (See **Section 2.1**).

Those points are discussed in the sections below, and in additional relevant chapters throughout this Guidebook.

3.4.1 Industry consultation and stakeholder engagement

Stakeholder engagement can cover a multitude of interactions between the administrator and programme participants, individual market participants, the public, the media, and others affected by the MV&E regime. To maximise the contribution of stakeholder engagement for improved compliance, the regime should:

- Have clearly identified objectives;

- Provide benefits to both the participants and administrators;

- Be integrated with other compliance related activities;

- Be subject to review and modification.

Consultation with programme stakeholders can significantly improve compliance and should occur during the design process of an MV&E regime, as well as at several stages of a programme's operation. Early consultation can deliver:

- Ownership and acknowledgement of the value of compliance processes;

- The development of realistic and clearly articulated requirements;

- Opportunities for harmonisation with other requirements for reporting or information provision;

- The identification of appropriate lead times for review, and the introduction of new or altered requirements;

- Awareness of programme compliance requirements amongst key industry groups, NGOs, consumer organisations and others that can inform their networks.

While some stakeholders may offer sound advice for improving the MV&E regime, others might behave less constructively. Any effective administrator can expect to be subject to criticism by its stakeholders about its general performance or its conduct in respect to specific investigations. Criticism can be reduced and responded to more successfully if the administrator:

■ Has clearly and publically articulated its compliance regime policy, practice and procedures, and, in the case of regulatory programmes, has conducted any formal public consultation prior to its adoption;

■ Has in place sound internal procedures for ensuring the appropriate application of its polices, practices and procedures, and maintains relevant records documenting these procedures;

■ Responds by reviewing its conduct and its compliance regime both periodically and in response to particular criticism;

Consultants with an outside expert or experts in the case of a dispute;

■ Stands firm in the face of unfounded criticism by continuing to implement its compliance programme consistently.

3.4.2 Reporting

There a numerous levels of reporting and communication discussed in this Guidebook, and each is important in demonstrating that programme compliance should be taken seriously. In particular, the benefits and risks of reporting compliance rates are discussed in Section 8.2. Typical reporting activities are likely to include:

■ Formal reporting by the programme to senior government staff or other government departments as a requirement of the legal or administrative framework;

■ Feedback to all stakeholders on the type and frequency of market surveillance, verification tests, and enforcement activities using mass communication channels such as websites or newsletters (See Box 7);

■ Feedback to all stakeholders on results of market surveillance, verification tests and enforcement activities;

■ Information to specific industry sectors on activities and results in their area of concern;

■ The communication of specific instances of non-compliance at the brand or model level to other stakeholders;

■ Sharing approaches and results with other national programmes to enable the better targeting of market surveillance activity (See Section 3.4.3 below).

An effective MV&E regime ensures that programme participants perceive the risks associated with non-compliance outweigh the benefits. Publication of the level of compliance activity undertaken and the results, particularly where enforcement action has been taken, heightens awareness of the risks. This is why there is now substantial evidence that publically reporting on compliance activity over a period of time leads to improved compliance (CIRE, 2007).

As a result, it is crucial that programmes avoid arrangements that limit access to compliance data or prohibit the public use of this data (except in very specific circumstances). Generally, a programme should widely report the scale, frequency, and type of MV&E activities undertaken.

Some, but not all, MV&E regimes that rely on third-party certification processes are not granted access by those third parties to the results of verification activities; nor is the general public. This lack of transparency can be overcome by S&L programmes requiring access to this information from any organisation authorised by the programme to provide certification or verification services. If necessary, consideration should be given to include the appropriate powers within legislation.

In voluntary S&L programmes, there may be concerns that publishing enforcement data will deter programme participation. However, suppliers are increasingly aware that protecting their investment in efficient products requires a robust compliance regime, including elements such as enforcement and public reporting.

Privacy of information may be justified where its disclosure would jeopardise other or future enforcement actions.

There are various kinds of information that can be provided to stakeholders in varying degrees of detail. To deal with the diversity of information available, as well as the particular concerns of stakeholders, programmes should develop strategies which identify the type of information from MV&E activities that will be made available to different stakeholder groups (See example from U.S. Energy Star in **Box 2**).

Further discussion on this issue can be found in **Chapters 5**, **6**, **7** and **8** of this Guidebook.

3.4.3 Information sharing

Many regulated products are traded globally. This provides the potential for information sharing between MV&E agencies in different countries or regions. In this context, the benefits of exchanging reported information on enforcement activity are to:

- Provide early warning of specific non-compliance where national standards are similar;

- Indicate potential loopholes in test procedures;

- Assess the compliance risk of corporations and/or products based on conduct in other jurisdictions;

BOX 7: PUBLISHING TEST RESULTS IN THE UK

Publishing the results of compliance activities is an important component of the UK's strategy to improve the average energy efficiency of domestic appliances.

In the view of the Department for Environment, Food and Rural Affairs (DEFRA), which is responsible for the implementation of European S&L programs in the UK:

"Enforcement and compliance are essential components to deliver the desired energy savings but also create a level playing field for industry. At present the rate of non-compliance in the UK is estimated to be around 10 to 15% at *manufacturing level* (failure to meet the claim on the label) and 20% at *retail level* (absent or incorrect labelling)." (DEFRA, 2010)

The results of all market surveillance and verification testing commissioned by DEFRA between 2004 and 2009 are available on its website. These reports provide stakeholders with information on the levels of compliance being achieved in the marketplace, often including the identification of individual models and brands.

DEFRA recently appointed the National Measurement Office as the UK Market Surveillance Authority for the Energy Labelling and Energy Using Products Framework Directives (DEFRA, 2009).

- Assess appropriate response to non-compliance based on a corporation's response to regulatory intervention in other jurisdictions;

- Provide inspiration for innovation in compliance regimes.

A model failing in one jurisdiction may indicate that the supplier's quality assurance processes may fail in other jurisdictions for the same model or similar models.

Where identical models are sold in different jurisdictions, opportunities from sharing data can be significant. In this example, sharing test results can avoid duplication of tests and significantly lower costs.

In sharing data, however, a programme administrator needs to be confident that certain specific conditions are the same, or close enough to the same for the data to be applicable. For example, that the test procedure and laboratory are appropriate for their programme requirements (i.e. that the operating environment for the appliance is similar in both cases), and that the appliance model is identical in both locations. When considering sharing compliance data, check the following:

- *Are there legal constraints to data sharing?*

- *What are the similarities and differences between programmes?*

- *How has data been collected?*

- *How will the data be used?*

- *Are there any differences in data collection or use which mean that the data would be misrepresented or misinterpreted?*

> **"Deterrence theory… maintains that there must be a credible likelihood of detecting violations, swift, certain, and appropriate sanctions upon detection; and a perception among the regulated firms that these detection and sanction elements are present"** (Zaelke, 2005)

Issues relating to sharing information on enforcement processes and actions are including in **Section 7.6**).

Sometimes information sharing starts at home, and there are numerous bodies and agencies responsible for a wide variety of product policies (safety, hazardous substances, certification schemes etc.) which would benefit from sharing information on non-compliance. There is also the potential to undertake combined verification tests.

In designing and implementing MV&E processes, programme administrators should consider the many opportunities to provide more effective MV&E processes at lower costs.

3.5 Key messages

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Golden rules:

■ Investment in compliance and enforcement regimes is likely to be one of the more cost effective means for governments to increase the environmental impact of S&L programs in the short and long terms.

■ The basic design of the MV&E framework will affect the distribution of costs amongst government and industry participants.

■ Care needs to be taken to ensure that where governments make programmes more attractive to participants by reducing their costs, they maintain the public funding necessary to ensure the ongoing integrity of the programme.

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There are several alternative frameworks for compliance regimes, and many options for how to implement the various components within a regime.

■ The exchange of information between programme administrators on different MV&E approaches and experiences can help programmes to better understand their options and the associated advantages and disadvantages.

■ Programmes can tailor a regime that is appropriate for its circumstances. In doing so, programmes need to take account of their objectives, resources, legal framework, technical capacity, industry views and other factors that may be programme or country specific.

■ Governments also need to consider which elements of the MV&E framework should be specified within legislation, and which elements are more appropriately defined through administrative arrangements or programme guidelines.

■ For mandatory S&L programmes, the definition and responsibilities of all participants together with the powers and sanctions that are needed to support effective compliance monitoring and enforcement, should be included in legislation. So too should consultation processes, public accountability and the reporting of outcomes.

■ To supplement the legal framework, all programmes should have in place compliance regime policies, practices and procedures that are available to all participants.

■ Governments need to ensure that MV&E regimes are adequately funded. Particular attention should be given to resources allocated to the administrative functions and to the infrastructure needed to support communication, consultation and record keeping.

■ MV&E regimes need to be managed effectively by ensuring that responsibilities are clearly articulated and implemented, and that all legal processes and administrative procedures are applied.

Communication tasks

■ Communicating information on compliance and enforcement activities and outcomes is important, as it illustrates to industry and consumers that programme compliance is taken seriously and that non-compliance will be detected and appropriate action taken.

■ Programmes should develop strategies and procedures that identify the type of information from MV&E activities which should be made available to different stakeholder groups.

■ Programme administrators should consult with stakeholders to determine ways that facilitate compliance and reduce costs.

■ Records of communication should be maintained at all times.

4 Entry Conditions
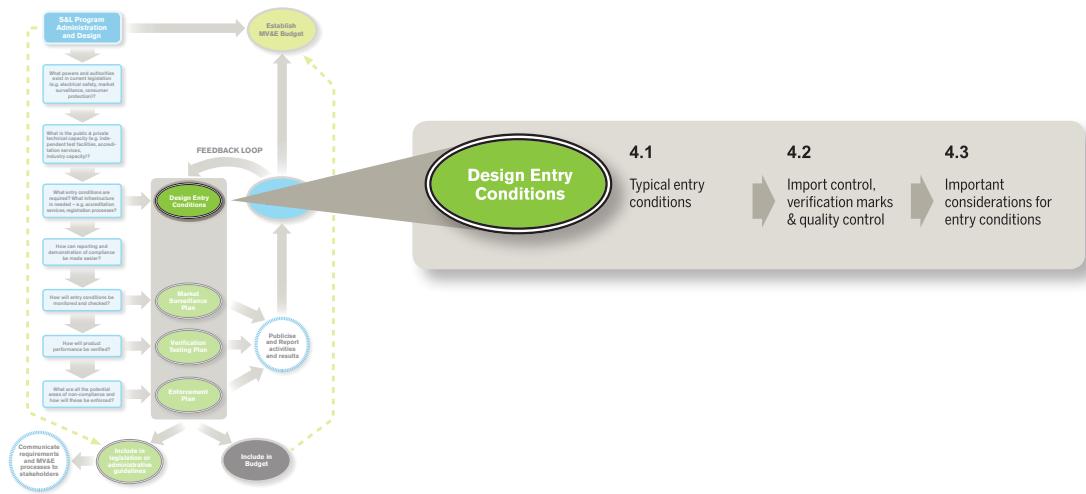
The term 'entry condition' in this Guidebook is used to describe specific obligations on product suppliers (manufacturers, importers wholesalers and retailers, and in some cases those leasing or hiring out products) in order to participate in S&L programmes.

Entry conditions establish the level of assurance provided to governments that products meet the energy performance and other criteria established by an S&L programme, and therefore play a central role in the MV&E regime.

Entry conditions can also provide an invaluable source of information to the programme administrator, including:

- ■ The number and type of products within the scope of the programme;

- ■ The energy performance of these products;

- ■ The sales volume or market share of models;

- ■ The details of suppliers responsible for placing individual products on the market, providing traceability for compliance purposes.

This information is invaluable because:

- ■ It establishes a claim of performance for individual models that can be verified;

- ■ Knowing what products have entered the programme enables the programme administrator to identify products in the marketplace that may be avoiding mandatory requirements;

- ■ Linking individual models to suppliers is vital for enforcement;

- ■ Collecting performance data supports an evaluation of the programme's achievements - required in order to maintain the support of governments, industry and consumers.

There are costs involved in reaching higher degrees of assurance in product performance, as well as in obtaining more data. However, these data lead to greater compliance benefits and opportunities for strong programme integrity, as well as greater accuracy in evaluating and monitoring the programme. The use of different entry requirements also has a major influence on the distribution of costs amongst participants. As a result, a full examination of the costs and benefits should be taken up before a decision about entry conditions is taken, including the exploration of innovative funding approaches and ways to minimise costs.

This chapter details the common types of entry conditions and discusses the features associated with each, highlighting relevant issues to consider when planning entry conditions for S&L programmes.

BOX 8: CANADIAN THIRD-PARTY CERTIFICATION PROCESSES

In Canada, the Energy Efficiency Act (1992; amended September 21, 2009) and the Energy Efficiency Regulations (1995) provide the legal basis for the minimum energy performance standards and comparative labelling programme (EnerGuide). Compliance with these laws is the responsibility of the Office of Energy Efficiency, part of Natural Resources Canada (NRCan).

The Regulations apply to dealers who import regulated energy-using products into Canada, or who ship regulated energy-using from one province to another.

The Act and Regulations place the responsibility for demonstrating compliance with energy performance requirements on 'dealers', which include manufacturers, importers and those selling or leasing energy-using products from a person who manufactured the product in Canada or imported it into Canada.

The specific responsibilities for dealers include:

- ensuring that only those energy-using products that meet performance requirements are imported or shipped inter-provincially;
- ensuring that customs release documents contain complete information about energy-using products;
- ensuring that energy-using products requiring an EnerGuide label are labelled accordingly before their first retail sale or lease;
- ensuring that an energy efficiency verification mark is on the product;
- sending an energy efficiency report to NRCan for new product models;
- sending a report to NRCan about the modification or export of below-standard products within 120 days of their import or shipment;
- providing sample product models to NRCan for testing and inspection, if required;
- keeping records of energy-using products for six years, unless otherwise authorised by the Minister of NRCan; and assisting NRCan inspectors.

The compliance structure uses third-party certification bodies to verify the performance of all regulated products, as follows:

All regulated products must carry an energy efficiency verification mark (eev) that is issued by a certification body that is accredited by the Standards Council of Canada (SCC), or a mark issued by a province.

These verification agencies technically review performance claims and establish the need for product testing. This testing can be conducted by the agency itself but more frequently other testing laboratories are qualified (including manufacturers) and are periodically visited to ensure technical competency and appropriate quality control procedures.

NRCan maintains a database of compliant products (i.e. products carrying an energy efficiency verification mark from an accredited certification organisation). An energy efficiency report must be sent to NRCan by the dealer before new energy-using product is imported into Canada or shipped between provinces. The report describes the energy-using product, provides information on its energy efficiency and the name of the organisation or province that carried out the product energy performance verification and authorised the verification mark that will be put on the product.

An additional feature of the Canadian compliance regime is that importers must provide regulated import information to Canada Border Services Agency (CBSA) to gain entry into the country. This import information is transmitted from CBSA to NRCan, where it is reviewed to ensure that the imported products are compliant.

4.1 Typical entry conditions

Design Entry Conditions

Entry conditions can include requirements for information about the energy performance of a product; supplier details; its market penetration or sales; specifications such as make, model, and dimensions; and may require evidence of quality control or assurance.

A survey conducted on behalf of the Collaborative Labelling and Appliance Standards Program (CLASP) in 2009-10 found that approximately 85% of standards and labelling programmes currently operating in over 20 countries around the world have some kind of entry condition (CLASP 2010).

Over three quarters of the surveyed programmes required a test report (or information from a test report) to be submitted as part of the entry requirements or provided upon request within a specified timeframe, making test reports the most common type of performance-related entry condition. Test reports fall into two main categories: 'independent testing' or 'self-testing'.

'Independent testing' usually involves an accredited third-party laboratory conducting standardised tests to accurately measure the energy performance of a product. In the case of 'self-testing', a supplier (manufacturer / importer) conducts an in-house test on the appliance.

In some instances, programmes may allow information on product performance to be based on calculations (e.g. the prototype's performance based on computer modelling) or assumptions (e.g. if a lower grade product in the model range has been tested, then this result can be used). These provisions can be useful where

BOX 9: SELF-DECLARED PERFORMANCE FOR REFRIGERATED DISPLAY CASES IN AUSTRALIA

Most S&L programs include a declaration by product suppliers at the point of entry in order to establish responsibility for the claimed performance of an individual model. This may be necessary if enforcement action is required at a later stage.

Elsewhere in this Guidebook there are examples of the sort of supporting evidence that may be required to justify these claims. In Australia, all suppliers must declare the performance of their regulated products through a registration process , usually supported by test reports.

In the case of commercial refrigerated display cabinets (RDCs), regulated from 2004, Australia has adopted a variation on the usual model.

Prior to the introduction of MEPS, there was no accepted industry standard for testing RDCs in Australasia. Imported cabinets may have been tested using either a European or US test method. However, no locally manufactured or imported cabinets had been tested to the new Australian standard before 2003.

With many hundreds of models on the market and only one independent test laboratory available, it was not feasible to require independent testing of all models prior to registration without incurring major delays to the implementation of the programme.

One alternative considered was to require evidence based on in-house testing. However, this would have favoured the larger suppliers with their own in-house test facilities over the many smaller companies.

The final option was to allow self-declaration based on similar tests, calculations or assumptions about performance. This option was selected on the basis that it was fair to all market participants and able to be implemented in a reasonable time frame given the constraints.

The government pointed out that verification testing would be targeted at those registrations that posed the highest risk of failure, i.e. with the least evidence to support the claimed performance.

Furthermore, should subsequent monitoring show that self-declaration was not sufficiently accurate, government reserved the right to introduce a requirement for testing.

the lowering of entry conditions is necessary, due to capacity constraints, for example (See **Box 9**). However, additional verification testing is required in these cases to ensure that programme integrity is not compromised. Where entry information is used to calculate programme impacts, the acceptance of lower grade information at the point of entry will make such estimates less accurate.

A variation on the third-party independent testing requirement is where one or more verification body is authorised to undertake the certification of products entering the programme (See **Box 8**). These bodies may be from the public, private or industry sectors, and require that certified products carry a verification mark to identify that they have met the required criteria. Verification marks are discussed further in **Section 4.2.2**.

In addition to requiring contact details for all suppliers, many programmes require suppliers to make a declaration that the product complies with the programme criteria. This serves to remind suppliers of the need to provide accurate information, and establishes a clear link between the product and supplier which may be required to support future enforcement action.

In addition to energy performance information, there are two other common types of entry requirements: market information (such as the provision of sales data or market penetration figures) and product information (such as the provision of non-energy related specifications). **Table 4** describes these entry conditions, as well as their general requirements and applications.

Table 4: Features of Typical Entry Conditions

Entry Condition	Description	Administrator Resource Requirements	Pros	Cons
Product Information: **Model Characteristics**	Non-energy related product specifications, particularly those that may have an influence on energy consumption. These include: size, volume, capacity, operational characteristics, etc.	Low	Information readily available to all market participants and relatively easy to provide. Enables an assessment of changes in product characteristics that may explain changes in energy consumption trends.	Creation of a large amount of data incurs moderate costs in information management for the administrator.
Product Information: **Model Identification**	Model number, serial number, date of manufacture. Sometimes dimensions and colour.	Low	Information readily available to all market participants and relatively easy to provide. Enables the identification of the supplier of an individual model, when visually inspected in market surveillance or verification testing. Necessary for compliance monitoring and enforcement. Data required to cross-check the model against relevant programme criteria.	Creation of a large amount of data incurs moderate costs in information management for the administrator.
Market Information	Provision of sales or market penetration figures by model. Typically includes a requirement to provide annual market information or on request for delivery within a specified timeframe.	Low	Information readily available to all market participants and relatively easy to provide. When combined with model energy consumption data, enables calculation of sales weighted average performance, and overall reduction in energy and greenhouse gas emissions.	Industry concerns about the commercial confidentiality of this information.

Table 4 continued

Entry Condition	Description	Administrator Resource Requirements	Pros	Cons
Energy Performance: No Test	Supplier declaration on model energy performance based on calculations or other assumptions.	Med	Can be delivered by all market participants with minimal advantage to smaller or larger companies. Low transactions costs to suppliers. Overcomes problems associated with cost of tests or lack of testing capacity.	Potential for inaccurate submission of information. To ensure integrity of the programme, there needs to be a high level of verification testing.
Energy Performance: Self-Test	Supplier declaration on model energy performance based on test report, where tests can be conducted in-house by the supplier.	Med	Higher level of confidence in data provided, compared to no test; therefore may require less verification testing. The cost of testing is met by the supplier.	Potentially unfair to smaller suppliers who are not large enough to have their own in-house testing facilities or reasonable access to these facilities. Therefore this condition has the potential to give larger participants a competitive advantage. The programme administrator has no control over the choice of appliance models tested, and suppliers may select a 'golden sample'. Administrator has no control over the competency of the test, particularly in respect to overseas suppliers.
Energy Performance: Independent Test	Supplier declaration on model energy performance based on test report, where tests must be conducted by an independent laboratory. This condition may or may not include a requirement for information about the competence and independence of the test laboratory. Accreditation of the laboratory to international or national testing standards may also be required.	Low	Independent testing is potentially the most thorough entry condition, leads to opportunities for high compliance and strong programme integrity. Programme administrator is guaranteed that the test has been conducted correctly. Provides opportunity for greatest accuracy in programme evaluation and monitoring. The cost of testing is met by the supplier.	Imposes the highest cost on industry participants. Smaller suppliers may find these costs difficult to accommodate or pass on to consumers.
Energy Performance: Third-party Verification & Certification	One or more verification authority(ies) administer the certification of products prior to entering the programme. Verification authority may be a private, public or industry organisation. May be associated with a 'verification' mark to demonstrate that products have complied.	Low	Depending on the quality assurance process used, can lead to high compliance and strong programme integrity. Imposes low technical and administrative burden on the programme administrator. Provides high degree of accuracy in programme evaluation and monitoring. The cost of testing is met by the supplier.	Imposes a high cost on industry participants. Smaller suppliers may find these costs difficult to accommodate or pass on to consumers. Administrator may not be able to influence the verification process, the frequency of testing, sampling, etc.
Supplier Declaration of Conformity	Supplier provides a statement that the product meets any legal or voluntary requirements of the programme.	Low	Important to establish a clear link between the product and supplier; this may be required to support future enforcement action. Highlights to the suppliers its responsibilities under the programme.	May deter participation in voluntary programmes.

Chapter 4 - Entry Conditions

4.2 Import control, verification marks & quality control

The following three mechanisms can be used to provide additional information and controls to support a MV&E regime.

4.2.1 Import controls

In some countries, any imported appliances that are included in a mandatory S&L programme must be accompanied by shipment or import documentation containing information about the product's energy performance, model details, and make in order to gain entry to the country and its appliance market (see **Box 10**). Because this uses an already established institution and procedure, it is cost-effective to governments and reduces the overall transaction costs to suppliers.

Border controls may also be used to inform suppliers that a programme for appliance energy efficiency exists in a country and that they need to meet specific requirements.

4.2.2 Verification marks

Verification marks are applied to appliances that have been certified for energy performance, indicating that a product has been independently sampled and tested by a verification authority to ensure it meets relevant national standards (See **Figure 7**). Verification marks can be used to signify that a product meets a range of entry conditions.

Verification marks should not be confused with product labels, which provide information to consumers about the performance of an individual model. They are used primarily to provide a visual check that a product has passed a certification process, which can be helpful to market surveillance authorities.

BOX 10: USE OF BORDER CONTROLS IN CANADA

To monitor compliance with Canada's Energy Efficiency Standards and Labelling programs, Natural Resources Canada (NRCan) captures information from both energy efficiency reports and import documents.

Before the first importation or interprovincial shipment of any regulated appliance, Canada's Energy Efficiency Act (EEA) requires suppliers to provide energy efficiency reports. Required information includes the model number, the energy performance of each model, and the name of the agency that verified the energy performance. The reports are uploaded into a database where NRCan checks for compliance based on information contained in the report. The product itself must bear an energy efficiency verification mark from a certification organisation accredited by the Standards Council of Canada.

As well as the energy efficiency report and verification mark, Canada also requires that suppliers, when importing a regulated product into Canada, provide specific information on customs documents for all shipments. Specifically, requirements include details on the type of product, brand name, model number, name and address of dealer, and purpose of import. The majority of import reports are filed electronically prior to importation, while few are submitted to the customs officer at the time of importation.

If the customs document is not complete, the customs officer can refuse to allow the product to clear customs. A customs document contains less information than an energy efficiency report, but enough information to allow NRCan to verify that there is a matching energy efficiency report. NRCan can then confirm that regulated products entering Canada meet minimum energy performance standards and can take action when necessary, including after the product is in Canada.

One of the aims of this system is to minimise the burden on regulatees (dealers of energy-using products, including manufacturers, importers and retailers). As much as possible, the regulatory requirements rely on information already provided in existing documents. In many cases, dealers will not need to complete separate paperwork in order to comply with Canada's EEA and programme requirements. Additionally, the documents provided by suppliers enable NRCan to maintain a product database (EnerGuide Directory) and product web search engines, which inform and educate the general public, utilities, and other organisations.

Figure 7: CE Marking used to show conformity with EU regulations including the Ecodesign Framework Directive
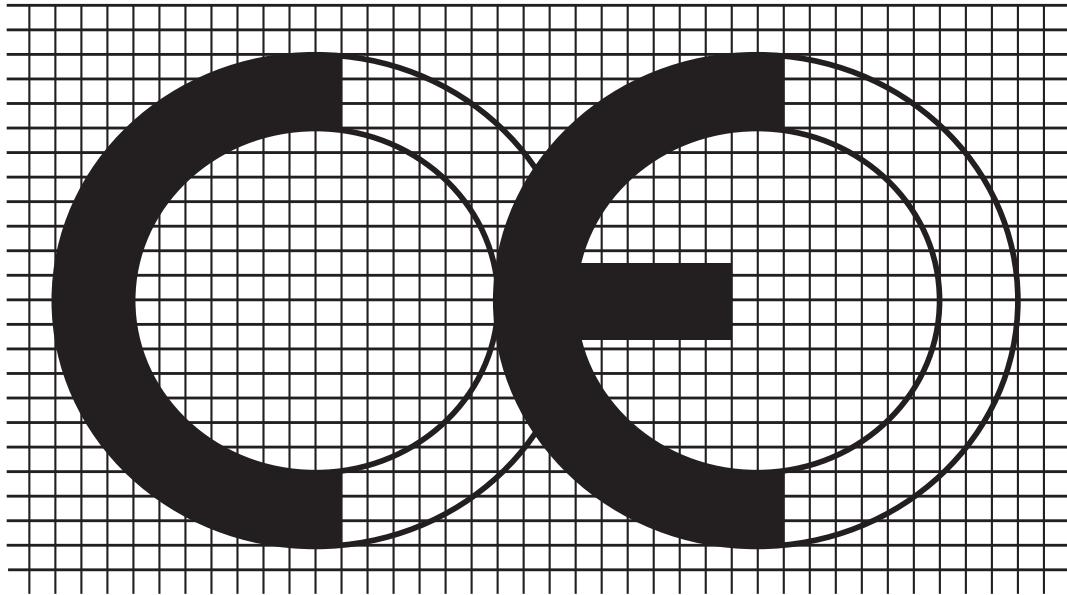
The CE marking must have a height of at least 5mm. If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.

The CE marking must be affixed to the product. Where this is not possible, it must be affixed to the packaging and to the accompanying documents.

4.2.3 Quality control processes

Some programmes reserve the right to conduct factory inspections as a condition of entry before a product can enter the market. Conducting a factory inspection allows the programme administrators to collect direct information about the quality control processes employed by a manufacturer, and therefore any likely variation in product performance.

4.3 Important considerations for entry conditions

Design Entry Conditions

4.3.1 The distribution of costs and benefits

Entry conditions call on financial, human, and technical resources. However, the design of the compliance regime will influence how these resource burdens are distributed between governments, industry participants and consumers.

The major design variations occur between programmes which require verified and/or certificated products as an entry condition, i.e. prior to participating in the programme, and those programmes with lower levels of requirements on entry. Examples of the latter include programmes that allow performance to be based on in-house testing (also referred to as self-test), or a simple declaration of conformity based on calculations or other assumptions, without the need to display additional testing documentation. These are referred to as 'Programme 1' and 'Programme 2' respectively in the following example.

Both systems can provide equivalent high levels of confidence if they are well implemented and adequately resourced. However, as shown in the following table, Programme 1 is cheapest for governments to implement, with industry contributing a larger proportion of costs, which may be passed on to consumers. In Programme 2, compliance costs to industry participants will be smaller, but the government contribution for verification testing and enforcement will need to be larger in order to attain the same level of compliance.

Table 5: Cost impacts to stakeholders

Stakeholder	Programme 1 Third-party verification tests and/or certification required as entry condition	Programme 2 Low level entry requirement, e.g. simple declaration or in-house testing
Government/Programme management	Low cost of verification testing	High cost of verification testing
Industry Participant	High initial compliance costs	Lower initial compliance costs
Consumers	May fund compliance costs in price of equipment	None

In designing programmes, governments must therefore consider levels of costs to impose on other stakeholders that are both equitable and feasible. This will be a major factor in determining which basic type of entry conditions will be most viable.

4.3.2 Phased costs

All entry conditions will have short, medium and long term costs associated with different phases of the programme. These include:

Establishment:

■ The programme administrator expenditure will include costs to develop databases, on-line tools, education of industry participants, and for initial data collection. Costs to suppliers depend upon the MV&E regime design, as noted above.

Implementation:

■ Implementation costs, and the distribution of these costs, can vary widely depending on the MV&E regime design, as noted above.

Monitoring & Evaluation:

- Periodically there will be costs associated with the evaluation of the programme, and the review of entry conditions to ensure they are still relevant and effective.

There are opportunities for administrators to recoup some costs, for example through the collection of administrative fees for the processing of information as new products enter the programme.

4.3.3 Human resources

Human resources are required to communicate requirements, respond to inquiries, and process information on products within the programme. This may include checking technical data and/or inputting information into databases. In addition, there is a need for the production of summary information for management purposes. Many of these functions can be distributed amongst staff, or shared with outside contractors. However, these tasks should be well managed so that processes are undertaken diligently and with consistency.

The skills of staff and/or consultants need to be realistically assessed and recalled over the life of the programme, as a lack of appropriate human resources will quickly lead to errors and cause a loss of programme credibility. This is particularly the case in larger programmes where the numbers of product models involved is likely to be in the thousands.

4.3.4 Technical support

Programme administrators need to assess the technical support required in relation to entry conditions. This will help governments to justify demands on industry, and to determine whether the skills required by the programme administrator can better be provided in-house or by contractors. It will also identify any major constraints in testing capacity and help to reveal the options available for increasing capacity.

In undertaking this assessment the following list of questions should be considered:

- How much technical information is required from industry participants and in what form? What is appropriate for the programme and how it will be obtained?

- Will independent test laboratories be required? What laboratories are available domestically? Can overseas laboratories be used? Do they need to be certified? How can laboratories become certified? How will they be funded? Will there be sufficient testing opportunities to make them commercially viable?

- Are there opportunities for self-testing? Do all suppliers (manufacturers/importers) have access to in-house laboratories?

- How will industry provide data? Are there ways to make this easier and quicker? Can reporting of energy performance be combined with other reporting requirements?

- What is the technical capacity of programme staff for the interpretation of test results or resolution of technical issues? How much technical capacity would staff actually need?

- What additional resources are needed to establish the required technical capability for the programme? Is additional staff training, industry awareness raising, test laboratory certification needed?

- Should external help be sought from contractors/experts in the field, especially in the early years of the programme?

4.4 Communication and timing

Design Entry Conditions

Communicate requirements and MV&E processes to stakeholders

Programme administrators need to ensure that any suppliers who have access to the market in which a country's programme operates are aware of their obligations. There are many risks associated with insufficient communication, including:

- A lack of compliance with entry conditions because programme participants do not know about the conditions;

- A lack of compliance because programme participants have not provided the correct information, i.e. while they knew about the entry conditions, they were not properly informed about how to fulfil their obligations.

Important issues to consider in respect to communication and entry conditions include:

- Advanced notice should always be provided when introducing new or changed entry conditions, so that all affected parties know what is expected of them and by when. The administrator should always consider phase-in periods to allow programme participants to adapt to changed entry conditions;

- Since informed participants may gain an unfair competitive advantage over those who are uninformed, particular care should be taken to communicate with all stakeholders, such as suppliers, industry associations, other relevant parties (customs or retail outlets), as well as consumers when appropriate;

- Administrators will need to spend considerable effort contacting overseas suppliers, particularly where no existing records exist, for example from border authorities or pre-existing programmes;

- Entry conditions should be designed to avoid undue delays or impose unnecessary transaction costs, as this will deter compliance and be a barrier to entry for voluntary programmes. Consideration should therefore be given to alignment with other processes

required of industry, such as import documentation and safety testing, if time and costs can be reduced;

■ Working with potential or existing programme participants on the development of entry conditions can be a very useful way of ensuring that any requirements are realistic and can be met within the given time frame.

4.5 Key messages

> ### Golden rule:
>
> ■ The requirement imposed on industry for third-party certification or third-party test reports provides the greatest level of assurance, and shifts the cost burden away from governments; while entry requirements that lower the costs to industry, such as self-testing by suppliers, will require larger budgets for verification testing by the authorities to reach equivalent levels of assurance.

■ Entry conditions are established to guarantee the integrity of the energy performance criteria recognised by the S&L programme, and therefore play a central role in the MV&E regime.

■ Entry conditions can also provide an invaluable source of information to programme administrators enabling them to:

- identify products in the marketplace that are avoiding mandatory requirements;

- link individual models to suppliers and follow through with enforcement;

- evaluate programme achievements, which are required in order to maintain the support of governments, industry and consumers.

■ Although there are considerable costs involved in reaching higher degrees of assurance in product performance and in obtaining more data, these will improve compliance benefits and programme impacts. The use of different entry requirements also has a major influence on the distribution of costs amongst participants.

■ An assessment of the available technical capacity in support of a programme is an important step in determining which entry condition options are better tailored for its success.

■ In countries with significant levels of imported products, the use of border control authorities can improve compliance rates and reduce transaction costs for governments and industry.

■ Governments need to assess and adequately fund the staff and/or consultant resources required by programme administrators to manage entry into programmes efficiently and consistently, taking into account the need for resources to grow as the number of coverage of the programme expands.

Communication tasks

■ To avoid possible confusion amongst industry participants, entry conditions need to be clearly explained in the regulations or scheme's rules, and support for their interpretation provided by the programme administrator.

■ Particular attention needs to be given to ensuring that overseas suppliers understand their obligations.

■ Early consultation with industry should be used to design processes that minimise transaction costs and are realistic; and to ensure that adequate warning of requirements is provided.

5 Market Surveillance
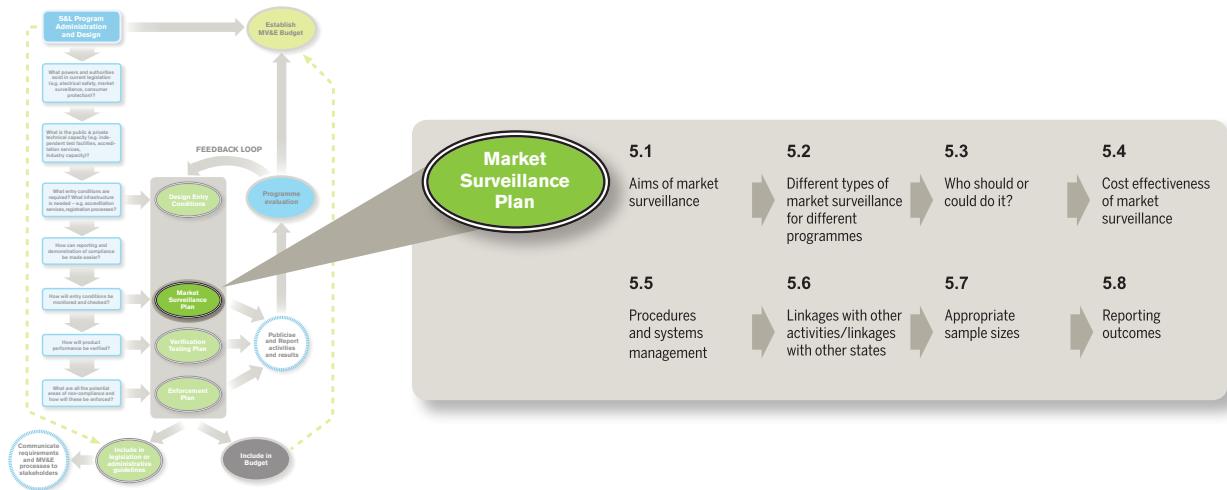
5.1 Aims of market surveillance

Market Surveillance Plan

The term market surveillance is used in this Guidebook to describe those activities required to ensure compliance with programme conditions once products are in the marketplace. The primary aim of market surveillance is to ensure a high level of compliance with policy intent in a cost effective way. In instances of non-compliance, market surveillance acts as the precursor to verification testing (covered in **Chapter 6**) and possible subsequent enforcement (see **Chapter 7**). It achieves this by identifying potentially non-compliant products, ensuring that higher cost verification testing can be organised in a cost effective manner.

Market surveillance is most readily applicable to both mandatory and voluntary labelling programmes, since these have a variety of obligations that can be checked in the retail environment (i.e. who should provide/apply the label, how the label must look, where it is fixed etc.). There is also a need for surveillance in the context of MEPS to ensure that all products in the marketplace are compliant with whatever entry requirements or regulatory conditions may be applicable. Where verification marks are required, these can also be observed through surveillance activities. Since market surveillance is one way to check requirements contained in the programme rules (See **Section 3.3**), the design of market surveillance activities will depend upon programme specific obligations, i.e. which bodies are responsible for doing what.

Even where there are no entry conditions, it is important to monitor what is in the market to highlight products whose suppliers may not be aware of MEPS or are attempting to evade the requirements.

Internet and other forms of distance selling also fall within the scope of market surveillance. With ever increasing numbers of products sold online (often from overseas suppliers), there is a need to both include this area within the legislative framework of programmes, and to ensure that products sold by this means are compliant.

5.2 Different types of market surveillance for different programmes

Market Surveillance Plan

5.2.1 Complaints based market surveillance

Traditionally many compliance regimes have been reactive – that is, driven by complaints from competitors, NGOs or consumers.

Complaints can provide a valuable resource to programme administrators, and successful complaint handling can be a powerful tool. Enlisting the support of competitors, the public and NGOs can significantly add to the pressure for widespread compliance, and ways to encourage their collaboration should be investigated (See **Box 11**).

However, programme participants are more likely to be able to detect or at least reasonably suspect non-compliance, but they may be reticent to lodge complaints for fear of retaliatory complaints from their competitors.

Therefore market surveillance authorities should not rely solely on tip-off information but devise their own procedures to carry out systematic and effective compliance checks.

5.2.2 Market surveillance for energy labelling

Market surveillance is particularly applicable to energy labelling programmes since there is a significant amount of declared information provided directly on the label itself, or available indirectly via registration or self-certification schemes (subject to the specific requirements of the appropriate regulations or scheme rules). In the first instance, market surveillance comprises a check that the product in the shop, brochure or internet site carries a label that is compliant with the applicable regulations or scheme rules (See **Box 12**).

BOX 11: US ENFORCEMENT HOTLINE

The US Federal Energy Regulatory Commission runs an Enforcement Hotline to enable market participants and the general public to complain or report market activities or transactions that may be market manipulation, an abuse of an affiliate relationship, a tariff violation, or other possible violation or concern.

BOX 12: SURVEILLANCE OF REFRIGERATOR LABELS IN AUSTRALIA

Australia operates a compulsory registration scheme for domestic appliance products requiring labelling.

A market surveillance survey conducted in 2009 throughout Australia in which 25,000 whitegoods products were inspected in 256 retail outlets revealed an average compliance rate of 98%. A very good result, which was a continuation of an improving trend with the national average rising from 93% in 2001 and 96% in 2004 (MEA, 2010)1.

The "Stage 1"check list (below) can be used by anyone carrying out this initial stage of market surveillance.

Stage 1 Market Surveillance checklist – in the shop, brochure or internet site

- *Is there a label?*
- *Does the product identification on the label match the product to which it is attached?*
- *Is it displayed in the required place?*
- *Is the overall design e.g. colour scheme and information layout in accordance with requirements?*
- *Is all the required information provided?*

Where necessary, and only if whoever is carrying out the market surveillance has the necessary authority and the regulations or schemes are in place, there can follow a second and more demanding stage under which the registration details can be examined for completeness and can be compared to the declarations made on the label itself.

Whilst Stage 1 (above) can be undertaken by relatively junior staff (and at extremely low cost), application of this second stage requires greater expertise since assessing whether the specific performance declarations are correctly applied will require the assessor to have an appropriate level of technical knowledge.

For such purposes the "Stage 2"check list (below) can be used when carrying out this secondary stage of market surveillance.

Stage 2 Market Surveillance checklist – comparison with declarations

- *Is this product subject to a registration requirement or file retention requirements under self-certification rules?*
- *Has this product been registered in accordance with the requirements?*
- *Upon examination, do these registration particulars appear compliant with the requirements?*
- *Is model correctly identified?*
- *Are the required performance level(s) equal to or better than the label values?*
- *Has testing been performed by an approved laboratory (if applicable)?*

Alternatively, in cases of self-certification:

- *Have the self-certification details been supplied in a timely manner following their request?*
- *Upon examination, do these registration particulars appear compliant with the requirements?*

- *Is model correctly identified?*

- *Are the required performance level(s) equal to or better than the label values?*

Cases of non-compliance can then be followed up. Follow-up procedures are normally specified in the legislative regulations or scheme rules. The issue of appropriate sanctions is more fully discussed in **Chapter 7.** However, often minor infringements are best responded to swiftly by notification, fines, or other sanctions that fall under administrative arrangements. In cases of mislabelled products, the evidence is usually irrefutable and the matter solved without dispute. Only when infringements are repeated, systematic, or more severe is it necessary to escalate the response to greater sanctions.

5.2.3 Market surveillance for MEPS

Market surveillance of MEPS regimes ensure that all products in the marketplace are compliant with whatever entry conditions are applicable; usually by law (e.g. compulsory registration in the Philippines, compulsory self-certification schemes in the EU leading to CE marking, etc.).

Since products subject to MEPS only are unlikely to carry performance declarations in the form of labels, market surveillance of these immediately becomes more challenging. Checks can only be carried out by accessing the necessary registration details or self-certification files. In this case, surveillance authorities may need to devise ways of accessing files remotely, for example through handheld IT devices.

The market surveillance approach for MEPS thus largely follows the second stage approach for labelling described earlier.

MEPS Market Surveillance checklist

- *Is this product subject to MEPS?*

- *Has this product been registered in accordance with the MEPS requirements?*

- *Upon examination, do these registration particulars appear compliant with the requirements?*

- *Is the model correctly identified?*

- *Are the required performance level(s) equal to or better than the MEPS?*

- *Has testing been performed by an approved laboratory (if applicable)?*

Alternatively, in the cases of self-certification:

- *Have the self-certification details been supplied in a timely manner f ollowing their request*

- *Upon examination, do these registration particulars appear compliant with the requirements?*

- *Is the model correctly identified?*

- *Are the required performance level(s) equal to or better than the MEPS?*

Greater expertise is likely to be required to carry out this checklist, since assessing whether the specific performance declarations are correctly applied will require the assessor to have an appropriate level of technical knowledge.

Market surveillance for distance and internet sales

Perhaps the most challenging area for market surveillance is that of distance selling, i.e. where the product is only available via catalogue, internet or other sales points, and where the person undertaking market surveillance may be unable to directly access the product under examination unless it is first purchased. There may be no certainty that the product supplied is the one being described, and confirmation of the identity of the product can only be established by examining its rating plate or other form of model declaration.

However, these are not reasons to avoid implementing market surveillance of products from such sources. A certain level of monitoring can always be undertaken, particularly where the source of supply is within the borders to which the regulations or scheme rules apply. For example, a subset of checks can be made from *Stage 1 & 2 Market Surveillance Checklist* (see above), should the regulations require that distance sellers display label information alongside the product information they place in their catalogue or on web pages.

Other market surveillance activities

All the market surveillance activities described thus far have focused on monitoring the market. Some focus on prevention is also crucial in helping suppliers to understand their responsibilities for providing information labels on products, and in manufacturing and supplying products that meet or exceed a specified efficiency level. Market surveillance authorities following best practice provide training programmes in regulatory compliance for manufacturers and suppliers, label interpretation for retailers, and label and standards design factors for enforcement officials (See **Box 13**).

> **BOX 13: DOWNLOADABLE ENERGY LABEL TEMPLATES FOR WHITE GOODS IN THE UK**
>
> **Trading Standards (responsible for the enforcement of the display of the energy label in the UK) have collaborated with local authorities and retailers associations to help retailers get their labelling right.**
>
> **Colour templates for each category of product were prepared and are available on a dedicated website to download and print off. This enables retailers to fit the data sheet to the template and affix to the product, thus helping them achieve compliance. The downloads are available from: http://www.lacors.gov.uk/lacors/ContentDetails.aspx?id=19509**

5.3 Who should or could do it?

Market
Surveillance
Plan

Market surveillance can, and often is, carried out by a number of different bodies, as discussed below.

5.3.1 The market surveillance authority and public bodies

This is the body that has the official responsibility for market surveillance and, crucially, is responsible

for the enforcement of any applicable regulations. The implementation of any mandatory labelling or MEPS policy must identify such a body and ensure that it has a full range of enforcement powers vested to it (see further discussion in **Section 3.3**). Some government funded organisations (agencies, bodies or trusts) also have a role to play in setting up voluntary S&L programmes in partnership with interested stakeholders (e.g. country's top performing mark/scheme) and carrying out the relevant market surveillance activities.

5.3.2 Trade bodies and associations or industry groups

The development of voluntary agreements (also called industry commitments) to operate labelling or MEPS schemes is usually led by the appropriate trade body. They develop the applicable performance standards (often in partnership with government policy makers) and the scheme rules. It is their scheme, and thus their responsibility for ensuring its continuing credibility (See **Box 14**). Any voluntary agreement needs to include procedures for market surveillance, verification, and sanctions for non-compliance at a minimum. Best practice schemes, and those seeking to be recognised by authorities as suitable alternatives to mandatory regulations, would include requirements for governance by other stakeholders, such as government officials and consumer NGOs when appropriate. This provides for a level of independent verification to ensure that sufficient products are tested, enforcement actions are properly taken, and checks that the voluntary agreement effectively covers the market claimed.

5.3.3 Consumer organisations

The publication of test reports on products is a large part of the function of many consumer organisations. Most of these reports concentrate on performance aspects and frequently include energy efficiency amongst the results published. So long as those tests are conducted following similar methodology to that required under the relevant regulations or scheme rules, then the results, whilst falling short of verification testing, are nevertheless a useful assessment of performance for market surveillance authorities as well as for building wider awareness of surveillance activities.

> **BOX 14: INDUSTRY ASSOCIATION CERTIFICATION PROGRAMME (AHAM, 2006)**
>
> The USA Association of Home Appliance Manufacturers (AHAM) sponsors a voluntary certification and registration programme for household dehumidifiers. This is intended to provide a uniform and commercially practical verification of manufacturers' certified water removal capacity and energy factor ratings.
>
> Participating manufacturers (Licencees) pay an annual fee which covers:
>
> - Inspection of Licensee's laboratory facilities and quality control procedures;
> - Verification testing 100% of new models and 50% of existing models;
> - Use of the certification seal: "AHAM Certified, Water Removal, Energy Factor, ANSI/AHAM DH-1".
>
> The Licensee must also fund the purchase of product samples from the market (where required) for testing, and any further tests of products found to be non-compliant.
>
> In addition to the normal process of verification tests, the programme includes a challenge function which allows AHAM or other Licensees to request a particular model to be tested if there is justifiable suspicion that it is incorrectly rated.
>
> Where the test sample is not within the allowable tolerance, the Licensee can chose between the following three options:
>
> - Request that a second sample be tested;
> - Re-rate on the basis of the single sample test;
> - Withdraw its product from the market.
>
> Where the second sample is non-compliant, the Licensee must either re-rate or withdraw the product.
>
> The results of individual verification tests are shared with the relevant Licensee or the challenging Licensee, where relevant, and with AHAM. With respect to the public or any other organisation, all results are confidential.

5.3.4 Retailers of own-brand products

Many of the larger retailers sell products under their own brand names, though the products are manufactured by another party. In many countries, this can mean that the retailer has legal responsibility for such products and so will be required to ensure they are correctly labelled and compliant with all other relevant legislation such as MEPS. For many retailers it is not sufficient to take the necessary steps to ensure compliance prior to first placing products onto the market. They also need their own surveillance programme in accordance with their quality assurance (QA) procedures and standards, and should continue to make occasional compliance checks on production samples.

5.4 Cost effectiveness of market surveillance

Market Surveillance Plan

Market surveillance needs to be integrated into the policy measure and ensuing regulations at the outset to ensure maximum cost effectiveness. This can be improved in a number of ways:

■ Suppliers register entries directly into an internet accessible database. This reduces administrative costs, as access costs are lower than requesting case by case details via written correspondence;

■ Where self-certification regulations require the supplier to hold test results on file, these results must be available within maximum time limits, e.g. 10 working days;

■ Stage 1 of label checking can be done by lower cost junior or interim staff;

■ Using a systems approach to selecting the key models to check in a market surveillance operation can save substantial costs, as many models in a seeming large market are in effect the same model with only minor cosmetic differences. Consequently, the technical details submitted at registration or otherwise held by the supplier may all be based on the original model and on which all the subsequent derivations are based. The supplier could also maintain an internet accessible master file of similar models, such that the authority can immediately identify which technical details are to be scrutinised. Focusing market surveillance on this original model could enable a large number of other models to be covered too;

■ A penalties (fines) regime may enable the authority to recover the costs of any successful prosecution;

■ Having a single authority whose sole purpose is market surveillance (possibly covering areas in addition to energy efficiency), is able to develop cost efficient procedures, and build cost saving expertise.

5.5 Procedures and systems management

Market Surveillance Plan

Establishing transparency of all actions taken by market surveillance authorities is of the upmost importance. The basic role of the authority is that of monitoring or policing, so the authority must conduct itself in a manner that is appropriate and professional, and it must be able to defend its actions as they come under scrutiny.

The following is a non-exhaustive list of procedures that should be developed to ensure transparency and rigor:

- A procedure for selecting shops or samples to be audited. Since it is likely that only a small portion of any particular market can be subject to surveillance at any one time, the procedure therefore needs to record the reasons for selecting a particular portion of a particular market. (The reasons can be as diverse as: not been checked before, new entrants to market, existing poor compliance record, intelligence led, etc.;

- Obtaining samples from the market can be challenging. The lowest cost way to obtain samples is to request that they be supplied by the manufacturer or importer. However, there is a risk that such a sample could be specially prepared and thus not representative of what is available in the marketplace. Furthermore, there is a possibility that samples initially identified during market surveillance may need to go forward to verification testing and eventual enforcement action. The legal requirements in such cases can be strict, with a need to ensure both a chain of custody for each sample as well as secure storage;

- Correspondence with manufacturers and suppliers needs to be undertaken in accordance with an established procedure. It is necessary to ensure that this is done in a consistent way, that complete records are kept, and that everything is done in a way that would support an enforcement action, should one eventually follow;

- As market surveillance may eventually lead to an enforcement action, it is essential that records are well maintained, with procedures established to ensure the appropriate evidence is collected correctly and that written records are made in ways that can demonstrate to a Court's satisfaction that all the appropriate procedures have been strictly followed;

- A procedure for applying administrative penalties, if applicable. This area would be particularly open to scrutiny and challenge, so an established and transparent means for deciding the level and type of penalty to apply is an essential requirement.

5.6 Linkages with other activities/linkages with other states

Market Surveillance Plan

Given the resource limitations under which any market surveillance activity is likely to operate, it is sensible for any authorities with overlapping responsibilities to avoid duplication by sharing of intelligence, experience and operating plans. This is particularly applicable where the responsibility for surveillance is not centralized, but is devolved to authorities at the state or regional level. Examples include EU Member States (See **Box 15**) and the 16 Länders under the German federal system.

Avoiding duplication is not necessarily easy to accomplish. Some authorities may guard their intelligence for various reasons. Therefore the process of building links may require perseverance, and should begin with low ambitions until participants have become accustomed to sharing and have gained the confidence of their fellow participants.

BOX 15: CO-ORDINATION AMONGST EUROPEAN MARKET SURVEILLANCE AUTHORITIES

The Ecodesign Administrative Cooperation group (ADCO) comprises Market Surveillance Authorities of all EU Member States and has been established to improve cooperation in the implementation and enforcement of S&L programs across Europe.

ADCO is the first serious attempt to build effective linkages between market surveillance authorities with responsibility for energy efficiency in Europe.

Recognising that many common products are sold in Member States, ADCO will consider a joint strategy for product testing, enabling the development of a consistency in testing and enforcement. This may lead to the sharing of test results amongst Member States in order to help determine which products placed on the EU market may be at risk of non-compliance.

5.7 Appropriate sample sizes

Market Surveillance Plan

Deciding how many samples to check can be challenging. Resource limitations and the size of the markets to be surveyed often mean that sample sizes will fall short of a statistically significant level. Therefore, difficult decisions have to be made: Is it better to undertake an in-depth survey of just a part of the market (i.e. small sample size), or is it better use the same budget to undertake a less in-depth survey of a broader part of the market (i.e. a larger sample size)? The "right" answer depends upon the circumstances.

For an unknown market, it is usually more appropriate to make a shallow survey across a broad range of products. For an established market, especially where there is some intelligence about compliance problems, it may be more appropriate to study a specific area in considerable depth, e.g. focusing on particular channels or suppliers with known or suspected low compliance rates.

Any decision on sample sizes for market surveillance purposes should always be mindful of the programme's requirements for verification testing (e.g. numbers of samples needed to derive meaningful statistical results and possible prosecution), as the models selected in the first instance may then be subject to actual laboratory testing following a strict pre-established procedure and methodology standard.

Market surveillance authorities should always be conscious of the possibility of follow-up activities leading to an enforcement action being taken. This is why appropriate procedures must be developed and followed. Where the market surveillance authority is not the verification testing and/or enforcement authority, then it is essential that a formal Memorandum of Understanding (MoU) or similar agreement is developed to establish the roles and responsibilities of each of these bodies.

5.8 Reporting outcomes

Publicise and Report activities and results

The police's most powerful weapon is visibility, as evidenced by drivers slowing when they see a police car. Making market surveillance activities visible – through reporting them to as large an audience as possible – is essential to the success of any MV&E program. Options for achieving this include:

- Production of an annual report that details levels and areas of activity and provides an overview of results obtained. It is important to report both compliance and non-compliance. Publication of the annual report ensures a transparency of operation for all stakeholders to review;

- Report results to any supplier, manufacturer, retailer or wholesaler concerned and request an action based response where appropriate;

- Report results to the relevant Trade Association and request an action based response where appropriate;

- Report results to the Trade Associations of the manufacturers' customers – the wholesalers and retailers;

- Publish results on a public domain website (See **Box 16**);

> **BOX 16: PUBLISHING TEST RESULTS IN UK**
>
> Publishing the results of compliance activities is an important component of the UK's strategy to improve the average energy efficiency of domestic appliances.
>
> In the view of the Department for Environment, Food and Rural Affairs (DEFRA) which is responsible for the implantation European S&L programs in the UK:
>
> "Enforcement and compliance are essential components to deliver the desired energy savings but also create a level playing field for industry. At present the rate of non-compliance in the UK is estimated to be around 10 to 15% at *manufacturing level* (failure to meet the claim on the label) and 20% at *retail level* (absent or incorrect labelling)." (DEFRA, 2010)
>
> The results of all market surveillance and verification testing commissioned by DEFRA between 2004 and 2009 are available from its website. These reports provide stakeholders with information on the levels of compliance being achieved in the marketplace, often including the identification of individual models and brands.
>
> DEFRA recently appointed the National Measurement Office as the UK Market Surveillance Authority for the Energy Labelling and Energy Using Products Framework Directives (DEFRA, 2009).

- Report results to regional or international forums and share them with authorities in neighbouring states;

- Report to senior government officials, providing an opportunity highlight the best performing suppliers or retailers.

Visible policing exposes risk to those suppliers who seek an unfair market advantage by not abiding by the requirements of the programme, whilst at the same time it displays support to those who do. Publishing results can also provide a benchmark and possible best practice examples that serve to encourage other less active market surveillance authorities.

In addition to the need for visibility, there is the need to ensure data is reported to enable formal monitoring and evaluation of the market surveillance activity (See **Chapters 8** and **9**).

5.9 Key messages

Golden rule:

- **It is essential to design market surveillance strategies that systematically identify and report on non-compliance, even for what appear as minor offences, such as not correctly displaying a label. This sends a powerful message to stakeholders that non-compliance is likely to be detected.**

- **Market surveillance needs to be undertaken regularly and can be tailored to suit the circumstances and rules of each programme. Expert market surveillance services, NGOs and consumers can all be used to improve programme capacity in this area.**

- **Since market surveillance acts as the precursor to verification testing in many cases, the set of rules established and followed by the programme administrator at this stage will impact the effectiveness of subsequent testing and enforcement actions.**

- **In countries with significant levels of imported products, the services of border control authorities to highlight energy efficiency requirements and undertake checks on product conformity can improve compliance rates and reduce transaction costs for governments and industry.**

- **As the complexity of market surveillance grows the administrator should ensure that appropriate procedures and systems management are in place.**

Communication Tasks

- Programme participants, industry associations, NGOs and consumers have a role to play in detecting non-compliance and should be encouraged to participate in market surveillance activities.

- The level of market surveillance checks and outline results should be shared with stakeholders and publicly reported. Detailed results of market surveillance should also be reported so long as it does not risk impacting on subsequent verification testing and possible enforcement actions.

6 Verification testing
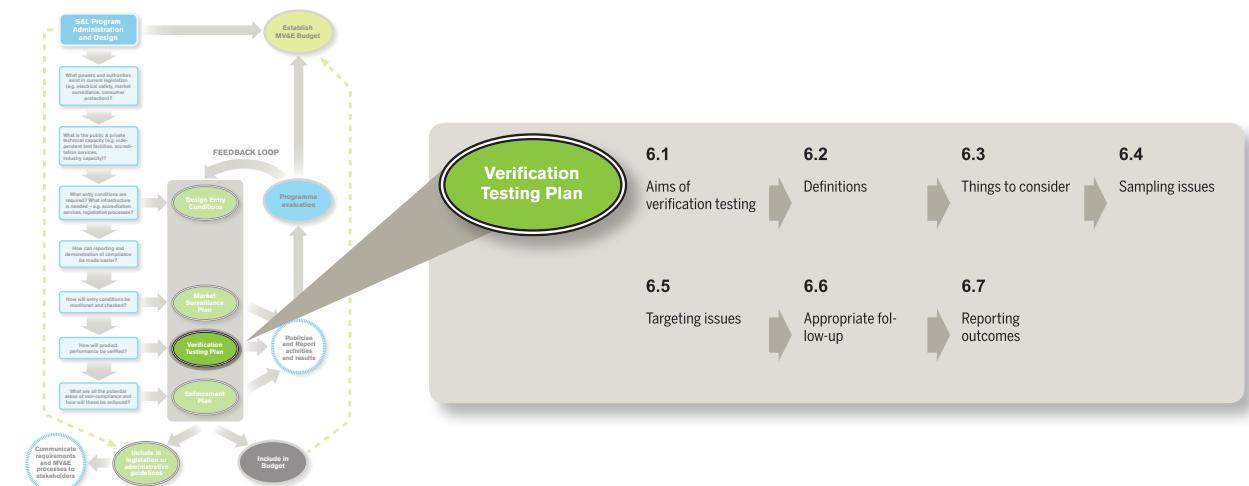
6.1 Aims of verification testing

> The integrity of energy-performance information for equipment covered by standards is a primary requirement for a successful standards-setting and labelling programme. All standards-setting and labelling programs rely on measuring and accurately declaring the energy consumption and energy efficiency of the equipment concerned. Without a means of measuring equipment energy performance, it is impossible to launch a meaningful standards-setting and labelling programme. **(CLASP, 2005)**

Unless there is a means of checking the accuracy of energy label claims or minimum energy performance levels, there can only be limited enforcement following on from market surveillance activity (**Chapter 5**). Verification testing thus forms part of the process which begins with market surveillance and ends with an enforcement action.

Verification testing is always about checking whether an energy performance product is as claimed, however the nuanced roles of verification testing may vary depending upon the design of the MV&E regime. Where entry conditions do not require certification, verification testing is used as the main

method of checking performance. In cases where products are subjected to verification and certification prior to entering the programme, then further verification by programme authorities is needed to check whether the certification process are sufficiently rigorous.

The information contained in this chapter relates to both roles.

6.2 Definitions

Verification Testing Plan

Some important definitions used in this chapter include:

6.2.1 A test

A test is a technical operation that consists of the determination of one or more characteristics of a given product according to a specified procedure (ISO/IEC, 2004).

6.2.2 A verification regime and verification test

A verification regime is the process specified by the standards and labels programme, sometimes in law, to determine whether the declared energy performance of equipment available on the market is accurate. Testing normally forms the core of the determination of whether energy performance claims have been met. There are three main forms of verification testing listed below in order of ascending stringency:

- Screening tests in which the specified procedure may not necessarily be followed precisely, in order to provide a reasonable indication of energy performance at a lower cost and more quickly than in a full verification test. These tests are typically used to provide a preliminary assessment of products which are likely to fail a full verification test. Typical departures from the full procedure are that fewer replicate tests are made, laboratory or staff undertaking the tests may not be accredited, or not all of the test requirements are undertaken. These screening tests are sometimes referred to as check tests;

- Full procedure verification tests where the specified procedure is followed precisely in – ideally – an accredited laboratory and where all measurements and records stipulated in the procedure have been followed. Full procedure verification testing would normally be the process followed in support of subsequent enforcement action;

- Third party certification in which the manufacturer or suppliers' claim of conformity to the specified procedure is verified by an independent and competent third party.

6.2.3 A specified procedure

A specified procedure is the method of test identified in the appropriate regulations or programme rules. Most frequently, the test method is identified as a published test standard such as a national, IEC (International Electrotechnical Committee), or ISO (International Organisation for Standardisation)

standard. Such standards will provide detailed instructions to be followed by laboratories undertaking the required tests and should ensure the generation of accurate and repeatable results.

6.2.4 Laboratory accreditation

Laboratory accreditation is the procedure by which an authoritative body gives formal recognition that an organisation or person is competent to carry out specific tasks (ISO/IEC, 2004). This is of particular importance for full procedure verification testing, as accreditation reinforces the integrity of the laboratory undertaking the tests; the results of which will form the main body of evidence in a major enforcement action.

6.3 Things to consider

Verification Testing Plan

6.3.1 Sufficient test facilities

Testing of products to the standards necessary to ensure a successful enforcement action requires a high level of skill and access to a suitably equipped test laboratory. Consequently, such facilities are a prerequisite for any effective compliance regime. These facilities will usually exist either as government establishments or as independent commercial enterprises. It is rare that individual manufacturers' facilities will be able to satisfy requirements for independence. However, there are many examples where industry associations undertake verification testing.

The skills and equipment required to undertake tests represent a substantial financial investment [3] and one that a commercial enterprise is unlikely to undertake without some confidence that the market for those services will be large enough to justify the investment. Therefore it may be necessary for programmes to identify future testing budgets and even to undertake tendering processes to encourage the development of new facilities. The choice of testing, certification, accreditation, and verification regimes may be constrained by existing legal precedents. With regards to mandatory programmes, the administrator may be legally required to use a specific accreditation body, or may have to implement its verification process according to some existing legal framework [4].

It is certainly possible that authorities or organisations wishing to begin an energy labelling or MEPS programme will find that the existing testing capacities are inadequate and hence that additional capacity will need to be developed (See example from China in **Box 17**). Sources of possible laboratory capacity include: government regulatory or research laboratories, college/university laboratories, independent private-sector laboratories and laboratories affiliated with industry associations.

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3 The size of this investment will depend upon the type of product being tested and the number of separate product categories within the scope of the programme.

4 Chapter 8, CLASP S&L Guidebook

Where local capacity is constrained, a further option is to use the services of overseas testing facilities, and this is particularly applicable to countries with a high proportion of imported products. National programmes can make arrangements with laboratories in the country(ies) of origin of particular products to cover the purchase and testing of selected products.

BOX 17: CHINA BUILDS NEW LABORATORY TO ENHANCE COMPLIANCE CAPACITY

China began mandatory labelling of appliances in 2005, commencing with air conditioners and refrigerators. The number of domestic and commercial products requiring labelling has rapidly increased, with 19 products now being labelled. All products that are subject to mandatory labelling are required to self declare the performance level and register the declaration with the China National Institute of Standardisation (CNIS).

The Administration for Quality Supervision, Inspection and Quarantine (AQSIQ) is the body responsible for all "product quality", and is thus formally charged with the responsibility for product compliance. However, the National Development and Reform Commission (NDRC) have overall responsibility for all energy conservation work in China, and have delegated the responsibility for product efficiency compliance to CNIS. A collaborative approach has been developed whereby AQSIQ takes responsibility for ensuring labels are actually applied to the products, and CNIS takes responsibility for check testing products to verify the claims made on the label by suppliers.

Verification testing varies slightly depending upon the type of product being checked, but in general products are either taken from manufacturers or purchased in the market. Models that fail initial tests have a second round of testing with further units purchased and tested at "independent" laboratories.

However, following a surprising number of products passing the second round of testing compared with the original failure rates, the Chinese regulatory authorities deduced that results from some of the "independent" laboratories may have been less reliable than anticipated. Consequently, CNIS has built a new laboratory to act as final independent arbiter for second round testing (and also to undertake research for standards development). The laboratory is also charged with verifying the capacity (equipment and operational practice) of all laboratories that are authorised to undertake efficiency testing for 19 products for acceptance by CNIS. Further, over the coming years, the new laboratory will conduct round robin testing on energy efficiency for all labelled product groups (e.g. electric motors in 2010, and lighting in 2011) to assist eligible laboratories in China to improve their testing capability, improve the consistency of testing results and also to improve the staff's capability.

The 5 year plan commenced in 2007 with approximate funding of $US30m (excluding land cost). The laboratory is capable of testing: air conditioners (fixed frequency), multi-connection air conditioners, water chillers (small volume), unit air conditioners (small volume), refrigerated display cabinet, refrigerators, washing machines, induction heating cookers, rice cookers, water heaters, (with CFL being ready in next year). Development of laboratory capabilities is ongoing with an anticipated further investment of US$2m in coming years for equipment and training to enable testing of a wider array of products.

6.3.2 Competence of test facilities

Since the success of enforcement actions involving performance requirements is determined by product test results, it is essential that these results are reliable and will be found accurate if challenged. Assuming that the specified procedure is technically sound and provides acceptable levels of repeatability and reproducibility[5], then the best way to ensure the competence of the test laboratory is to require that it be accredited. This is a specialised process usually carried under the auspices of *ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories*, but with reference to the specified procedure i.e. the laboratory does not receive a generic accreditation but is specifically accredited for the required procedure.

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5 Repeatability: that repeated measurements on the same product in the same laboratory have similar values.
   Reproducibility: that the same measurements conducted in different laboratories have similar values.

Normal practice, should there be no national accreditation body, would be to seek accreditation from the national accreditation body of another country. Details of suitable bodies can be obtained from ILAC – the International Laboratory Accreditation Cooperation (**www.ilac.org**). See **Appendix 1**.

Ultimately programmes can hold the threat of withdrawing accreditation from laboratories and certification authorities consistently demonstrate unreliability and inaccuracy (See **Box 18**). This is a particularly important sanction in the case of underperforming verification services, which otherwise may tend to reduce costs to attract business and hence be less rigorous in product testing.

6.3.3 Reliability of test results

Specified test procedures need to be technically sound and provide acceptable levels of repeatability and reproducibility. Standards administrators are well aware of this requirement and frequently seek to establish the reproducibility of test methodology by instigating round-robin correlation tests in which different laboratories take turns to test the same reference machine to the same methodology. In many cases, even the best test methodologies are open to interpretation and this often explains the divergence of results. Therefore the use of guidance materials associated with particular test procedures can greatly improve reproducibility. A methodology can be used with confidence only when the results from all laboratories show an acceptable level of variability.

Ideally, though rare in practice, test methodology standards should identify all sources of uncertainties of measurement and specify maximum limit values for each of the laboratory measurements (see for example *clause 4.3 of EN 14511-3*, specifying the test methods for the rating and performance of various types of space heaters and coolers).

Assuming that the specified procedure is sound and the laboratory is suitably accredited, then two remaining sources of data variability need to be considered:

- Manufacturing variation between different samples of the same product. Some level of performance variation between different samples is to be expected – although largely reduced by tightening production processes - and it is a task of the specified procedure to identify either a tolerance level and/or the number of replicate samples to be tested;

- Laboratory testing uncertainties. Uncertainties are defined as a parameter associated with the result of a measurement, which characterises the dispersion of the values that could reasonably be attributed to the measure (Eurachem, 2007);

- Laboratory uncertainties, like manufacturing variations, cannot be avoided, although they can be contained. It is the laboratories' responsibility to both minimise them and to report the maximum uncertainty of their test independent of the individual uncertainties of measurement. Maximum declared uncertainties exceeding 5% should be subject to particular scrutiny. In order to contain this potential problem,

it is recommended that maximum uncertainties are agreed with the verification test laboratory before any contract is placed with them.

6.3.4 Tailoring the compliance approach to practicalities and financial resources

Full procedure verification tests vary in cost depending upon the methodology and the product under test. They can be expensive, costing several thousands of dollars each. As a result, enforcement authorities should use these types of tests prudently, where their impact is likely to be the greatest.

Many authorities use screening tests as a lower cost option to select products where enforcement action is likely (See **Box 19**). Examples of lower cost screening tests include using a reduced number of samples to be tested, e.g. one sample would need to be tested in a screening test programme, compared to the need to test four in order to prepare for enforcement action.

Similarly, as the results of screening testing are unlikely to be subject to the full scrutiny of the law courts, it might be possible for some of the simpler test procedures to be carried out by less well trained staff than those employed in accredited laboratories, e.g. screening test to check whether products comply with the 1 Watt standby requirement are now being widely adopted worldwide using simple measuring instruments on shop floors).

> **BOX 19: SCREENING TESTS IN AUSTRALIA**
>
> Australian authorities have developed a cost efficient form of screening test, known locally as Check-testing. This procedure begins with a stage 1 check test, which requires a full or part test to the relevant Australian and New Zealand Standard, to be performed on one sample of the model. The sample is generally independently purchased (usually from a retail outlet) and tested by a laboratory accredited for check testing on behalf of the regulatory authorities. If that first sample fails the stage 1 check test, then the onus is on the manufacturer or importer to either provide evidence that the sample tested was defective or to fund a more elaborate stage 2 process requiring the testing of replicate samples.
>
> **(DEWHA (2009)**

Manufacturers may undertake simpler check testing of competitor products, perhaps to better understand how those competitors are achieving the levels of performance claimed or, in the case of a mis-declaration, in order to provide a source of intelligence to the enforcement authorities.

The selection of products with a high likelihood of failure is another means to maximise the effectiveness of testing expenditure, and the topic of targeting is further discussed in **Section 6.5**.

6.4 Sampling issues

Verification Testing Plan

There are a number of sampling issues to consider before undertaking a verification test regime. Three aspects of good practice are usually worth following:

- Samples need to be representative of what is being supplied to the market and thus should be purchased from the market, rather than obtained directly from the supplier;

- Care should be taken when obtaining multiple samples for replicate testing to ensure that they come from different manufacturing batches. Where this is not possible to determine, it is recommended they are obtained from different outlets to reduce the possibility of testing samples with manufacturing faults that were confined to a particular batch;

- Many seemingly different models of a product may turn out to be essentially the same model with minor cosmetic differences only. The use of market research to determine whether a single model could be selected to be representative of all these different models could provide cost savings or enable a verification programme to be extended to a larger range of products.

6.4.1 Sampling for enforcement purposes

The number of samples, replicate tests required, and method-ology should all be specified in the corresponding regulations or programme rules, and/or referenced in international, local or harmonised testing standards (See **Box 20**).

6.4.2 Sampling for check or screening testing programme

The sampling profile relates closely to the aim of the testing process. In the case studies from Australia and the UK (**Box 7** and **Box 19**), the aims were to provide both a market picture of compliance levels to the authorities and send a message to manufacturers and suppliers that the authorities were undertaking checks. In both cases, it was important to test a sufficient number of products. This gives some level of confidence to the authorities that the results obtained were reasonably representative of the whole market, and demonstrates to the supply-side that there was real risk in being caught in the policing net.

In other cases, it could be legitimate to target a specific market sector, particularly if there is intelligence that identified a likely need for verification testing.

Regardless of whatever sampling programme is followed, there is a possibility of criticism from disaffected stakeholders such as those supplying products that failed the tests. Typical complaints range from "it's not a typical sample" to "this is not a statistically valid sample". Whilst the programme administrator's sampling strategy must be justifiable on a range of grounds, it is worth remembering too that, when reporting on the test results of a single sample, consumer organizations often say, "we bought this from a shop just like any other consumer would have done, and what we report is factually correct…"

BOX 20: PROCEDURE FOR PRODUCT MONITORING CHECKS

The procedure for Defra's monitoring of product performance data is detailed in a briefing note available from the Department's website. This document not only describes how the resulting data shall be published or otherwise issued, but it also covers issues such as guidelines on the selection of testing projects.

http://www.mtprog.com/spm/download/document/id/604

6.5 Targeting issues

Verification Testing Plan

Effectively targeting testing is especially important when a programme deals with a vast amount of product categories, which may not all be subject to yearly compliance activities. To maximise the cost-effectiveness of testing, programmes should therefore identify products with an above average risk of non-compliance. Options for criteria to use in selecting products for testing for include:

- New market entrants;
- Products from suppliers with poor records;
- Information from competitors or consumers;
- Sector specific targets.

Additional criteria that can be used include:

- Highest estimated energy savings;
- Market share.

In order to avoid criticism of bias, programmes should publish guidelines detailing the criteria used for targeting products for verification tests.

6.6 Appropriate follow-up

Verification Testing Plan

The investment in verification testing is only warranted if the test results are acted upon by the relevant authorities. In most cases, the follow-up procedure undertaken as part of an enforcement or verification programme will already be defined by the applicable legalisation or a programme's administrative rules. These procedures must be followed correctly. In the cases where there is no pre-defined procedure to be followed, then verification testing should always lead to some form of follow-on with the manufacturer or supplier.

This should be done regardless of whether the product was found to be in conformity with the requirements. If compliant, then the supplier is reminded that monitoring is taking place. If not in conformity, then the supplier needs not just to be informed but to be challenged as to what corrective action they intend to undertake. Under these circumstances, communication needs to be maintained until that supplier has demonstrated that the necessary corrective action has been completed. Issues relating to enforcement are covered in Chapter 7.

6.7 Reporting outcomes

Publicise and Report activities and results

Reporting outcomes of any screening or verification tests is an important part of the compliance regime. In addition to communication with relevant suppliers, further reporting options include:

- Inform the respective trade associations. This should always be done regardless of whether the products were found to be in conformity with the requirements. If in conformity, then the supply side has been reminded that monitoring is taking place – something that all bona fide trade associations will welcome. Where not in conformity, then support from the trade association to ensure that corrective action is taken should be sought. Peer pressure applied through trade associations can be a very effective tool for improving conformity;

- Inform other verification authorities. Such information can provide useful intelligence authorities in neighbouring jurisdictions;

- Publish the results. This significantly increases the visibility of the verification action. It demonstrates to all stakeholders that monitoring activity is taking place and increases pressure on manufacturers and suppliers to ensure that they only market products which are in conformity with the requirements.

6.8 Key messages

Golden rules:
- Verification testing is the cornerstone of compliance: without it a products' compliance or non-compliance when in operation cannot be established.
- Even when certification processes are used, verification testing is required to check that the processes used by certification agencies are sufficiently rigorous.

- The best way to ensure the competence of any test laboratory is to require that it be accredited by a national accreditation authority.

- Programme administrators need to ensure that test methods and laboratories produce results that are repeatable and reproducible. The use of round-robin correlation tests and guidance materials associated with particular test procedures can greatly improve the ability to use test results for enforcement purposes.

- Samples selected for testing purposes should be purchased from the market, in order to be representative, and where possible from different manufacturing batches.

- Programme administrators should always consider carrying out simpler screening testing either as a precursor or instead of full verification testing. These indicate where investment in further testing is warranted.

- Ultimately programmes can hold the threat of withdrawing accreditation from laboratories and certification authorities that consistently prove to be unreliable and inaccurate. This is a particularly important sanction in the case of underperforming verification services, which otherwise may tend to reduce costs to attract business and hence be less rigorous in product testing.

Communication Tasks

- Programme administrators should clearly communicate details of verification testing to industry stakeholders, including the procedures used to select of products, the laboratories used for verification tests and any appeals or re-testing processes.

- Where referenced test methods provide room for interpretation, programme administrators should issue additional guidance in order to reduce differences in test results.

- The quantity of verification tests undertaken and outline results should be shared with stakeholders and publicly reported. Detailed results of tests should also be reported so long as it does not risk impacting on subsequent verification testing and possible enforcement actions.

7 Enforcement
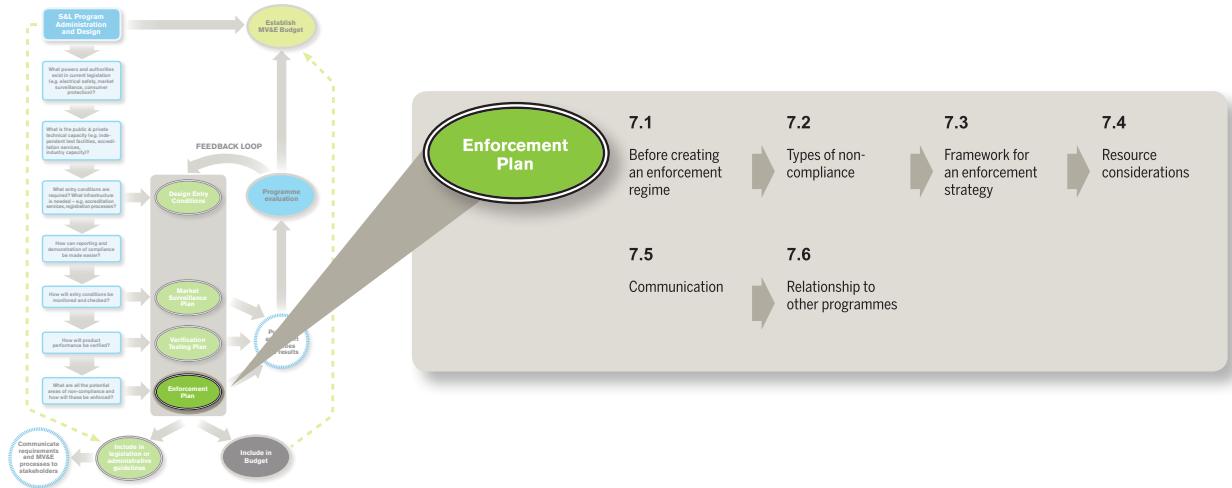
An enforcement strategy is a set of responses to incidents of non-compliance, coupled with a progressive action plan for their application that should include a range of elevating enforcement responses that can be implemented depending on:

- The severity of the non-compliance;

- The range of sanctions that are available;

- The type of programme (i.e. whether it is mandatory or voluntary);

- The quality of the evidence supporting the claim of non-compliance;

- The responsiveness of the party responsible for the non-compliance;

- The potential to rectify non-compliance.

If compliance is enforced, participants will be encouraged to comply when the potential costs, whether financial or to the participant's reputation, are greater than the benefits. Similarly, if programme participants consider that there is only a small chance of a transgression being discovered and that the associated penalty is also low, there will be little motivation to comply.

Enforcement, including remediation, is most effective when action is timely, i.e. responding to the detection of transgressions without undue delay.

Enforcement processes with a limited range of possible responses tend to be unwieldy and often require high levels of

> **It has been said of compliance at the national level that, "20 percent of the regulated population will automatically comply with any regulation, 5 percent will attempt to evade it, and the remaining 75 percent will comply as long as they think that the 5 percent will be caught and punished."** (Zaelke, 2005)

'proof,' which make them impractical in dealing with minor transgressions. A wider range of sanctions allows the enforcement authority to respond more quickly, is less costly, and more effective.

Where sanctions are necessary, they should be sufficient to outweigh the benefits of non-compliance in order to be an effective deterrent.

Taking enforcement action breeds compliance by elevating the perception of risk to industry participants. Only a relatively small number of major enforcement actions are required to alert industry to the ramifications of non-compliance.

There is a range of issues specific to enforcement discussed in the following sections. This range includes the type of compliance issues a programme is likely to experience: whether to publicise information about enforcement action; what powers or legislation are required to respond to non-compliance; at what stage enforcement action escalates to the next level; and what resources are required.

7.1 Before creating an enforcement regime

Enforcement Plan

Answering some basic questions will help to develop an effective enforcement strategy and highlight areas that need further information or investigation. A preliminary set of questions includes:

- *What types of non-compliance can be envisaged?*

- *What criteria will be used to rank types of non-compliance?*

- *What levels of compliance will be acceptable?*

- *What will be deemed as non-compliance?*

- *At what level of non-compliance will penalties commence and what will trigger their escalation?*

- *What action will be taken and by whom?*

The following sections provide further insight into these relevant questions.

7.2 Types of non-compliance

Enforcement Plan

Non-compliance can take numerous forms, can be the responsibility of various parties, and can occur at different stages in programme implementation. For example, industry participants may knowingly

or unknowingly commit an offence during the manufacture, import, testing, labelling or selling of a product. Common types of non-compliance are listed as follows:

- Failure to provide an energy label or other required energy-performance rating information;

- Failure to display an energy label or other required energy-performance rating information at the point of sale, including the use of a non-conformed label or logo;

- Misuse of the logo by industry participants who are not part of a voluntary programme and do not have the authorisation to use the label;

- Failure to register a product;

- Failure to provide proof of testing;

- Failure to submit a product for testing;

- Failure to cooperate with certification or verification testing bodies;

- Falsification of a product's energy performance, resulting in misleading labelling;

- Falsification of a product's energy label or a false statement of compliance with a MEPS;

- Failure to provide required energy-performance information in product catalogues, websites or other promotional media;

- Failure to cooperate with compliance authorities.

Most programmes will also have other items of potential non-compliance which are programme-specific. For each of these identified categories of non-compliance, programmes need to develop a realistic and appropriate line of action.

7.3 Framework for an enforcement strategy

Enforcement Plan

An effective enforcement regime must have the capacity to identify compliance breaches and respond with an appropriate and timely penalty. Once detected, investigation is needed to better understand the issue, identify responsible parties, and the potential for remedial action.

An enforcement regime must enable authorities to respond in a timely manner so as to minimise the impact of the offence on consumers and on other market participants, who might otherwise suffer from the unfair marketing of non-compliant products.

When developing an enforcement strategy that is able to quickly and adequately respond to instances of non-compliance, the following issues should be considered:

- Since there are many potential types of non-compliance differing in severity, there must be a matching range of appropriate responses that will act as a deterrent. There should also be multiple options for enforcement action for each type of non-compliance to allow for mild or extreme cases;

- It is important to consider the length of time taken to investigate and determine instances of non-compliance for each possible response, as this will have a bearing on the speed of reaction;

- It is also necessary to consider what level of evidence will be required to determine whether an incident of non-compliance has occurred, as this may also impact response times and costs;

- Administrators need to ensure that correct procedures are followed and accurate records kept in order to support enforcement actions;

- Where possible and fair, responses such as administrative sanctions, requiring a lower standard of proof by administrators but subject to appeal rights, may facilitate more effective resolution of non-compliance;

- Care should be taken to ensure that rights of appeal are not used to delay enforcement processes unduly;

- The opportunity for gaming and a speedier resolution of suspected cases of non-compliance can be facilitated by placing the initial onus of proof on the alleged non-complier;

- Administrators should consult with other compliance regimes and with industry to better understand what types of sanctions are likely to be most effective;

- The cultural and behavioural context of the programme's region may have a bearing on the responses selected. For example, in some cases the threat of 'naming and shaming' will be highly effective in deterring non-compliance, whereas financial or alternative sanctions may be more appropriate in other jurisdictions;

> **BOX 21: US COURTS BACK DOE ENFORCEMENT OF ENERGY STAR BRAND**
>
> In November 2008, the US DOE negotiated an agreement with LG Electronics regarding refrigerators with through-the-door ice and water dispensers that had previously been labelled as compliant with ENERGY STAR criteria (DOE, 2008).
>
> The DOE claimed the energy performance of selected products did not meet these criteria when tested according to the correct procedure.
>
> The remedial measures agreed include:
>
> - "LG voluntarily suspended the affected models from the ENERGY STAR® programme;
> - Consumers are to be offered a free in-home modification of the affected refrigerator models to make them more energy efficient;
> - Consumers will also receive a payment covering the energy cost difference between the new measured energy usage and the amount stated on the original Energy Guide label;
> - LG will also issue payments to consumers for future incremental energy usage for the expected useful life of the refrigerator – up to 14 years;
> - All models that had not been sold will be immediately modified prior to sale to ensure that they satisfied the obligations of the agreement."
>
> However, in response to evidence that some LG models continued to be non-compliant with ENERGY STAR, the DOE took the decision to terminate the Agreement and remove 21 LG models from the list of ENERGY STAR compliant refrigerators at the end of 2009 (DOE, 2009; EPA 2010).
>
> In response, LG sought a court injunction to retain the ENERGY STAR label on approximately 40,000 affected refrigerator-freezers. In January 2010, the US District Court upheld the DOE's decision, finding that it acted properly to protect consumers and the environment (US Gov, 2010).

- Administrators also need to consider what existing authorities and legal powers already exist and can be used, and whether new regulations or administrative arrangements need be established in order to support enforcement action;

- How cases of suspected non-compliance are treated while further investigation is underway should also be addressed. There may need to be interim measures that can be used during the investigation period in cases where the impact of the transgression is severe.

7.3.1 Escalation of enforcement action

Many enforcement agencies devise response strategies based on an "enforcement pyramid," shown in **Figure 8**. In this case there are six courses of enforcement action. However, the number of levels can vary. The lowest level of response corresponds to the least severe transgressions and is commonly dealt with through 'informal action' beginning with remediation. In response to progressively more severe instances of non-compliance, administrators elevate their responses to a progressively higher level, ultimately reaching the most onerous sanction, which in this example is 'prosecution' (See **Box 22**).

Figure 8: Enforcement Pyramid (Ayes and Braithwaite, 1992)

- Prosecution
- Settlement
- Letter of Warning
- Failure to Comply
- Informal Action
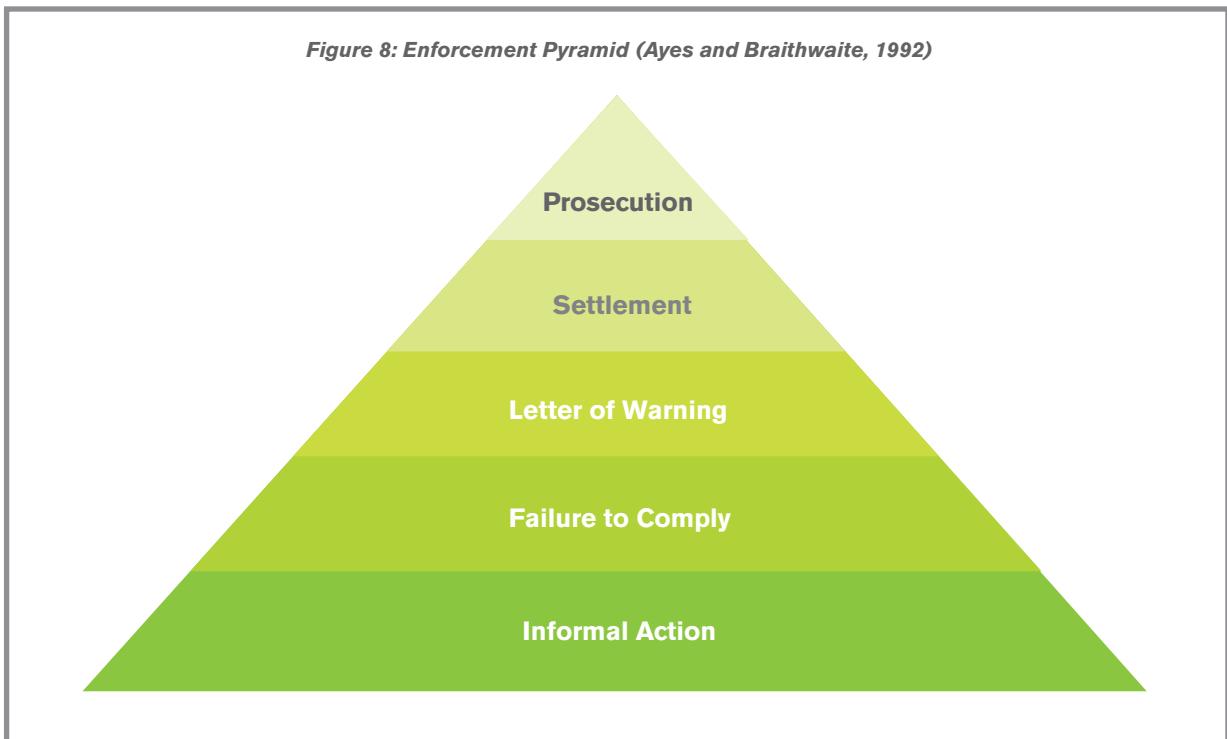
A list of responses which could be included in the hierarchy of enforcement responses (of which some can be used in tandem) includes:

- Educational initiatives;

- Warning letters;

- Informal settlements and undertakings to rectify non-complying behaviour;

- Formal court enforceable undertakings;

- Encouragement and support from other regulators (for example, a consumer protection agency) in taking action;

- Court imposed sanctions such as fines, declarations and injunctions;

- Corporate probation (similar to probation for individuals);

- Removal of a product from a list of qualifying products;

- Provision of compensation to consumers;

- Publication of instances of non-compliance (naming and shaming);

- Implementation of, or review and improvement to, an existing corporate compliance programme;

- Compensation to adversely affect persons or practical contribution to educational initiatives;

- Funding of educational initiative by the regulator or relevant 3rd parties;

- Provision of relevant data and other information to assist both parties to resolve a particular matter and to assist future compliance initiatives.

Administrators need to consider both the appropriate level of response for each type of transgression, and at what point to move to the next level. These decisions should be specified in the administrative rules or guidelines relating to each programme.

Some flexibility may be required, and programme administrators may make adjustments for particular industry environments. For example, a slower level of escalation up the enforcement pyramid may be appropriate in an industry when a product is first regulated (so everyone can become informed about and become familiar with the new regulatory environment), where non-compliance is minor, or where commercial gain from the conduct is not

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BOX 22: THE DEVELOPMENT OF NEW ZEALAND'S ENFORCEMENT STRATEGY (COLLINS, T., 2008)

When New Zealand introduced S&L regulation in 2002, the role of regulator was given to the Energy Efficiency and Conservation Authority (EECA). With little previous experience in this field, EECA and was initially reluctant to undertake enforcement action, preferring to rely on encouragement, advocacy and promotion to deliver compliance.

This position altered following representation from local manufacturers who believed their products were being undercut on price, as imports were not subject to the compliance costs of meeting MEPS or labelling. EECA staff highlighted to senior management and Board that inaction around enforcement was a reputational risk to the EECA.

As a result, a compliance and enforcement policy was developed in 2006 through a process involving a review of existing international approaches, obtaining 'buy in' from the EECA board, and communication with industry.

While developing the compliance and enforcement policy EECA looked at the typical questions for regulator in any country:

- Will the policy ensure the market for regulated products operates effectively?
- What powers can officials exercise?
- Can costs be recovered?
- How many members of staff are required to administer the policy?
- What may be done – what does legislation allow and what is administratively feasible given the resources and powers available?
- How can proof to evidential standard be acquired?

The policy adopted by EECA uses an 'enforcement pyramid' approach with the following six courses of enforcement action which are applied as necessary:

- Informal action
- Compliance advice letter
- Failure to comply letter
- Letter of warning
- Settlement
- Prosecution

apparent. Where non-compliance is more frequent and harmful, escalation should be correspondingly more rapid. If a banned product (i.e. not meeting mandatory MEPS) is placed on the market the administrator - usually the Market Surveillance Authority - is likely to go straight to the prosecution level and skip the settlement stage.

Market characteristics will also affect the likely success of various responses. For example, in industries with easy entry and exit, where corporate reputation is relatively unimportant, or where key business decisions are made offshore, lower level responses may not be as effective.

7.3.2 The role of informal responses

Remediation is usually the least expensive and quickest way to resolve problems and is therefore usually the first step taken buy programme authorities.

Informal ways to address non-compliance should be part of a suite of enforcement responses. In this way programme administration can usually avoid lengthy and costly legal processes. Programme participants may prefer this approach as well. Even after non-compliance has been confirmed and enforcement proceedings commenced, there should still be multiple opportunities for the programme participant to admit to and rectify the non-compliance in order to keep costs and time (as well as penalties applied) to a minimum.

Where it is relatively straightforward to prove a case of non-compliance has occurred, it may be advantageous to use a series of pre-established fines. By using a system like this, costs and time are kept to a minimum, and the programme participant is given an efficient, clear message about the penalties for particular offences.

Administrative Penalties, for example, are made up of a range of actions, which can include Compliance Notices and Warning Notices, as well as Fixed and Variable Financial Penalties. These can be directly and immediately applied by the enforcement body rather than having to be taken through the criminal courts. This allows for more tailored responses, and sanctions can include requirements to compensate purchasers of products that are found to be less energy efficient than claimed.

7.3.3 When major sanctions are required

It is necessary for programmes to also have available a range of more stringent sanctions in order to raise the perception of risk. Even if major sanctions such as court action are used only rarely in practice, they need to represent a realistic threat in order to act as an effective deterrent. Once programme participants become aware that administrators are able and willing to invoke severe penalties, the need for their use will be less frequent (See **Box 23**).

Sometimes the legal basis for punishing non-compliance has to be built from scratch; but it is also common that relevant legislation is already in place (e.g. for safeguarding the integrity of information provided to consumers), and non-compliance can be addressed within the framework of that existing legislation.

If participation in the programme is voluntary, as for endorsement labelling, abuses can be treated softly, e.g. with threats that endorsement will be removed and/or abuses publicised. If a country has copyright law, it is often possible to protect a voluntary label by copyrighting it and then addressing any abuses under the provisions of that law.

Non-exhaustive legal basis for enforcement action of *mandatory* labelling/MEPS requirements include:

- The suite of enforcement powers listed in the Framework Regulation, Act or Statutory Instruments establishing the requirements for labelling/MEPS;

- Consumer protection law including unfair trading, false advertisement;

- Copyright law (although in the case of label misuse this implies that the label has been appropriately registered, e.g. as a trademark and only covers falsification or misuse by non-participants).

As always, the circumstance under which legal sanctions will be invoked, as well as any interim arrangements and processes, need to be specified within the programme's administrative rules and guidelines.

7.4   Resource considerations

Enforcement Plan

In terms of expenditure, the allocation of compliance regime resources should reflect the relative seriousness of the conduct (i.e. the harm caused by the non-compliance) and its relative frequency. Consequently, more resources should be allocated towards addressing non-compliance that causes the most impact and that occurs most frequently. However, prioritisation should not mean that no resources are allocated to low frequency and/or low impact non-compliance.

During programme implementation, the main resources required will be human and financial. Human resources could include programme staff costs to cover internal initiation, processing and follow-up of enforcement action, as well as communication of such action. Additional financial resource will most likely be needed for external specialists, such as legal advice or representation.

Pre-implementation resource requirements would be focused on enforcement regime development, and as such would include financial resources to fund internal development of the scheme but also, and importantly, funding for specialist advice or consultants relating to the development of legislation, regulation or related powers required to enact the regime; as well as the cost of legal representation if going to court.

BOX 23: AUSTRALIAN ENFORCEMENT PROCESS AND CONSUMER COMPENSATION

After five separate models were tested and all failed to comply, LG was referred to the Australian Competition and Consumer Commission (ACCC), responsible for consumer protection laws. In September 2006, an agreement was struck to compensate customers for increased electricity costs to a value of AUD$1.3 million.

In addition, LG made undertakings to publish corrective notices and improve their in-house compliance regime. Demonstrating that a little enforcement goes a long way, following publicity regarding the LG case, two major suppliers have voluntarily announced incidents of non-compliance in 2007.

As an indication of corporate responsibility, Mitsubishi Electric and Carrier Air-Conditioning informed the (then) Australian Greenhouse Office that a small number of models had been incorrectly labelled, and that they were voluntarily withdrawing them from the market and recompensing consumers to the value of additional operations costs.

Australia's Enforcement Process

- Has an enforcement team consisting of representatives from Commonwealth, State / Territory government agencies, and New Zealand that is responsible for managing the Australian end-use energy efficiency programme;

- Allocates a significant budget to check-testing in laboratories and related testing used for standards development and round robins;

- Makes use of publicity to motivate compliance by publicising non-compliance and a regular newsletter on the topic.

When developing a programme, governments should consider the mechanisms and resources that will be necessary for enforcing compliance. They should also determine who is to be responsible for coordinating enforcement.

7.5   Communication

Administrators must ensure that effort is taken to make participants aware of their responsibilities and the programme's enforcement processes, including notifying them of any changes (See **Box 24**). Information about new or altered enforcement strategies must also be communicated to programme staff and consultants so they are able to conduct their tasks effectively, and share necessary information with their stakeholders.

Communications about the enforcement regime and of enforcement actions taken are equally important.

Without communication about enforcement action, there may be no 'proof' for industry participants that enforcement action occurs and therefore less motivation to act in compliance with programme requirements.

Publication of enforcement action has also been proven to boost consumer confidence in programmes.

As a result, it is crucial that programmes avoid arrangements that limit their ability to publicise enforcement actions. The type of information potentially included in communications relevant to enforcement action includes:

> **BOX 24: PREPARING FOR ENFORCEMENT ACTION**
>
> **In December 2009, the DOE announced a 30 day window for suppliers of 16 product categories included in regulations to ensure that certification reports and compliance statements were filed correctly.**
>
> **It taking this action, DOE noted that it had previously responded to improper or insufficient certification filings on an ad hoc basis and allowed suppliers an opportunity to correct their filings.**
>
> **Having stated publicly that it intended to enforce the data submission requirements more rigorously, the DOE provided a 30 day window in order to treat all suppliers fairly and equally.**

- The number of incidents of enforcement responses over a stated period;

- The number of responses at each level of response over a stated period;

- The result of these enforcement actions, i.e. the response by suppliers;

- A listing of the brand names of products subject to enforcement action;

- A listing of model numbers of products subject to enforcement action;

- Identification of the justification for enforcement action for each brand or model;

- Identification of the energy performance of the model subject to enforcement action.

Communications may include a combination of this information.

Issues of confidentiality can arise. However, there should be no such concerns regarding the general reporting of the enforcement activities undertaken by the administrator or on his behalf. This also applies to the list of responses without identification of particular brands or models.

The specific situations where publication of detailed information may be inappropriate include where disclosure may jeopardise on-going or future enforcement actions, or in cultures where the naming of offenders is regarded as highly inappropriate.

To deal with the diversity of information available and the particular concerns of stakeholders, programmes should develop communication strategies that identify what level of information will be made available to different stakeholder groups.

7.6   Relationships to other programmes

Enforcement Plan

Sharing information between jurisdictions on enforcement approaches and actions can be useful in developing stronger and more innovative responses, and in enhancing perception of the risks of non-compliance. Information may be shared either through publication, or direct communication between programme administrators.

Although the legal and administrative frameworks available to programmes vary in different jurisdictions, there are nevertheless opportunities to learn from the approaches taken by other programmes. In particular, it can be helpful to observe the selection of different types of enforcement responses, and the reaction of industry to these, when programmes are developing their own pyramid of responses.

The sharing of information on specific enforcement action can, in the right circumstances, lead to action being taken in several jurisdictions against a particular brand or model. The risk that this may happen increases the potential severity of the penalty on global suppliers of products found to be non-compliant.

7.7   Key messages

Golden rules:

- All programmes should develop an enforcement strategy that includes a range of structured, elevating enforcement responses that can be implemented depending on the type of non-compliance and the responsiveness of the transgressor.

■ **Enforcement, including remediation, is most effective when action is timely, i.e. responding to the detection of transgressions without undue delay, and appropriate. Where sanctions are necessary, they should be sufficient to outweigh the benefits of non-compliance.**

■ **To minimise costs and speed up response times, strategies should include remediation and informal processes and sanctions requiring low levels of proof. However, it is necessary for programmes to have available a credible range of more stringent sanctions in order to raise the perception of risk.**

■ **Where verification authorities are used, programmes should have access to information to support enforcement, and retain the right to undertake appropriate enforcement action in support of the programme's integrity.**

Communication tasks

■ Programmes should develop communication strategies that identify the appropriate type of information to be made available to different stakeholder groups.

■ Sharing information between jurisdictions on enforcement approaches and actions can be useful in developing stronger and more innovative responses, and enhancing perceptions of the risks of non-compliance.

8 Identifying and Reporting Compliance Rates
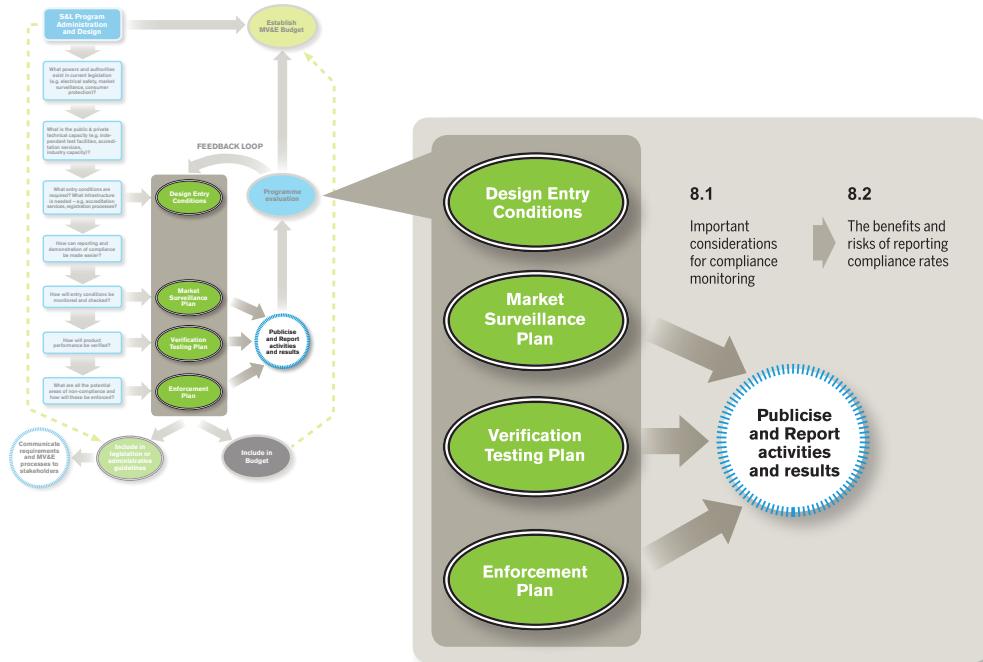
$$\Bigg(\ \text{“Things that are measured tend to improve”} \ (\text{Galbraith})\ \Bigg)$$

The processes discussed previously in this Guidebook allow programmes to assess the compliance of individual models of products with programme requirements. This chapter examines the aggregation of this individual data in order to build a picture of overall compliance for categories of appliances, or for the programme as a whole. This is often referred to as the compliance rate.

The monitoring of compliance rates is valuable in assessing the programme's MV&E regime, and therefore the likelihood of meeting overall objectives of the programme. Compliance monitoring enables the identification of programme weaknesses, and highlights those issues where remedial action can still be taken and that would threaten the integrity of the programme if allowed to go unnoticed (See **Box 25** and **Box 26**).

The results of periodic compliance monitoring lead programme administrators to ask important questions about their MV&E processes on a regular basis, including:

- How can we improve compliances rates?

- Why are there different rates for different categories of products?

- What are the weaknesses in the system?

- How can we do things differently?

- At which categories of products or MV&E processes should are resources be targeted?

The results of compliance monitoring also enable the more accurate assessment of the impacts of new and existing programmes (see **Section 9.1**). For example, known compliance rates from other programmes or from monitoring an operational programme provide realistic levels of compliance, and this will achieve more accurate impact estimates than assuming 100% compliance.

Monitoring has a further important role in providing information necessary for programmes to communicate effectively with their stakeholders, including government bodies, industry participants, and consumers. An assessment of compliance rates and the processes used to achieve them are likely to form a major part of the messages of programmes' formal reporting and informal communications.

Although programmes and governments may be concerned by the release of frank assessments of compliance rates, lest this damages credibility, this needs to be balanced against the benefits. These include the provision of increased resources to 'fix' the problems, leading to investment in MV&E processes and, through greater transparency, the development of a stronger 'culture of compliance'.

> **BOX 25: COMPLIANCE MONITORING IN THE EU**
>
> In 2007, a report was published on activity in EU member states relating to compliance with EU label regulations. It presented results from study conducted by the European Association for the Coordination of Consumer Representation in Standardisation (ANEC) and the United Kingdom's Department for Environment, Food and Rural Affairs (Defra).
>
> The study found an average of 20-30% of appliances in shops were not labelled, only three of the nine countries studied could present figures about in-store inspections, and only four of the nine countries asked for corrective action in writing after the discovery of unlabelled appliances.
>
> The study concluded that poor monitoring is a key barrier to the successful implementation of the scheme. The study went on to state that a significant factor contributing to low monitoring is the small budget (in monetary and human resource terms) often allocated to monitoring activities (ANEC and Defra, 2007).

8.1 Important considerations for compliance monitoring

Planning for effective compliance monitoring involves establishing data collection systems that will provide the correct information at the right time. The planning process therefore needs to begin by deciding what monitoring outputs are desired, when, and at what frequency.

By answering the following questions, administrators can refine the type of analysis that will be most useful and determine the inputs necessary for implementation:

- *What information will be required to check whether a programme is meeting its aims and objectives?*

- *What information needs to be communicated, to whom and when?*

- *Which aspects of compliance need to be measured?*

- *What constitutes non-compliance and how will it be measured?*

- *What is an acceptable level of compliance?*

- *How would this information be collected and at what frequency?*

- *Who would collect and analyse the information?*

- *What would be the timing of the monitoring?*

- *Are there constraints on what can be reported?*

- *Are there ways of removing these constraints?*

- *Are there opportunities for sharing resources or information?*

Alongside these issues, administrators must also consider the following management questions regarding resources and responsibilities:

- *Who is responsible for collecting the necessary information and analysing the data?*

- *What resources are required to collect and analyse the data?*

8.1.1 Degrees of compliance

Since programmes have many rules, it is not always possible to say that a product or a supplier is 100% compliant. They may, for example, meet the energy performance requirements but fail to follow all the administrative processes correctly.

BOX 26: IMPROVING ESTIMATES OF PROGRAMME IMPACTS IN CALIFORNIA

In order to provide more accurate estimates of the impacts of Californian building codes and Title 20 (mandatory) requirements for appliances, a 2006 review examined these issues in detail through selected surveys of retailers and wholesalers.

Generally the sales-weighted non-compliance rates varied considerably by measure. In some cases this can be explained by the different lengths of time that measures have been in force. The overall average rate of non-compliance was estimated to be 32%.

Table: Summary of appliance measure non-compliance estimates in California, 2006

APPLIANCE CATEGORY	ESTIMATEDNON-COMPLIANCE RATE	CERTAINTY LEVEL OF ESTIMATE
Televisions	41%	Medium
DVD players	57%	Medium
Residential pool pumps, tier 1	15%	Medium
General service incandescent lamps, tier 1	27%	Medium
Metal hallide luminaires	37%	Low
Walk-in refrigerator/freezers	0%	Medium
Pre-rinse spray valves	4.2%	High
Unit heaters and duct furnaces	44%	Low
Refrigerated canned/bottled beverage vending machines	63%	Low

(Quantec, 2007)

As a result, Administrators must take into account when monitoring and reporting compliance rates that there are degrees of compliance. It is therefore important to record not only the number of incidences of non-compliance, but the type of transgression involved. The legal and administrative rules of a programme should provide guidance as to the treatment of different types of non-compliance and these rules can be used to identify the main types of transgression to monitor and report.

While it is important to monitor all transgressions, including the number of minor transgressions, reporting all non-compliance will tend to overstate the severity of the problem and may lead to erroneous conclusions. As a result, any reporting should clearly state what types of non-compliance are included and excluded.

8.1.2 Compliance indicators and analysis

The selection of indicators of non-compliance will be based on the specific requirements for each programme, contained either within the regulations or in administrative rules of the programme. In general, the main indicators will include:

- The share of products and models included in the programme;

- The share of products and models found to be non-compliant (for each requirement);

- The type of transgression, i.e. administrative, energy performance;

- The degree of transgression, i.e. by how much did the discovered performance differ from the programme criteria.

The results of on-going MV&E activities will provide the majority of the data required for this analysis, although it may need to be augmented by further information, depending on the range of information required on entry. **Table 6** indicates the likely source of data for compliance monitoring.

Table 6: Information Sources for Compliance Monitoring

Data Required	Data source
Total Market for products or categories of products	Industry statistics Import data Market research data
Compliance with entry conditions	Programme administration records Verification authority records Border authority records
Compliance with Labelling requirements and verification marks	Results of market surveillance in retail, wholesale and distance selling outlets Industry surveys Consumer surveys (particularly for commercial equipment)

In interpreting the data and undertaking analysis of compliance rates, the following important issues need to be considered:

- Market data, including the market share at model level, is needed to estimate the overall impact of individual model transgressions;

- Periodic market surveys need to be undertaken to estimate if any regulated products (i.e. covered by mandatory S&L programmes), are not participating and therefore fail to be captured under any of the normal market surveillance activities;

- Verification testing is usually targeted towards those products most at risk of non-compliance and therefore these results are likely to indicate a higher than average rate of non-compliance. The simple aggregation of these results to the wider marketplace will probably overstate the rate of non-compliance;

- As well as the number of products failing energy performance tests, the results of verification testing can be used to examine the extent by which the products failed. Those benefits (in terms of cost savings, energy and environmental terms) that would be gained over the life of these products if greater attention was paid to compliance can be estimated from this;

- This latter exercise may be useful for indicating the appropriate level of resources for MV&E activities;

- The acceptable rate of non-compliance may change over time;, for example, it may be that lower rates of compliance are acceptable during the initial phase of a programme's implementation, or for industries that have not previously considered energy efficiency regulation or are particularly disaggregated. These factors may need to be explained in the report of compliance rates.

8.2 The benefits and risks of reporting compliance rates

Publicise and Report activities and results

Communicate requirements and MV&E processes to stakeholders

Reporting compliance activities involves documenting the outcomes of monitoring activities, and the delivery of reported outcomes to selected stakeholders. Reporting may include:

- Formal reports to governments as part of a legal or administrative requirement;

- Feedback to all stakeholders on compliance activities and results using mass communication channels such as websites or newsletters;

- Promotions by voluntary programmes to encourage wider participation;

- Information to specific industry sectors on actions and results in their areas of interest;

- Information to assist organisations undertaking programme evaluation;

- Sharing approaches and results with other programmes to improve performance;

- The communication of specific instances of non-compliance at the brand or model level. This particular issue is explored in **Chapter 7** of this Guidebook.

Many governments and programme administrators have historically been reticent to report on compliance activities and overall compliance rates for fear that this may damage the reputation of the programme, or, in the case of voluntary programmes, discourage suppliers from participating. In particular, there is a risk that reporting on compliance rates may threaten the allocation of resources and other forms of support if it is considered that the programme is not achieving its aims. Consumer confidence in labelling programs may also be affected.

Administrators therefore need to balance these risks against the potential benefits of reporting, which include:

- Gaining increased support for MV&E activities in order to build a culture that strives for achievement in compliance;

- Identifying cost-effective opportunities to increase the financial, energy saving and environmental achievements of the programme;

- Highlighting to participants that compliance is taken seriously by administrators and governments and is being addressed through specific activities.
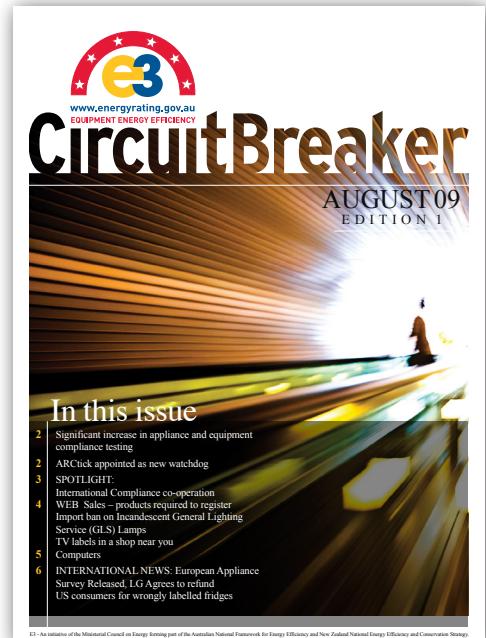
Individual administrators will need to make their own assessment of these risks and benefits for each of the target audiences. Each group of recipients is likely to respond differently, largely based on their expectation regarding compliance. For example, those less involved in the day-to-day work of the programme are likely to have higher expectations of compliance than those directly connected to it. Issues mainly arise when reported rates of compliance are lower than those expected. As result, there will be a need for each programme to develop a strategy for reporting, which differentiates between the information provided to each audience.

The issue of reporting requires sensitivity. However, in the longer term, greater transparency will help to safeguard the integrity of S&L programmes and lead to longer term, measureable achievements.

8.3 Key messages

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Golden rule:

- Compliance monitoring enables the identification of programme weaknesses and highlights those issues where remedial action can still be taken, but which could threaten the integrity of the programme if allowed to go unnoticed.

</div>

- The monitoring of compliance rates at the programme or product category level is required to assess the programme's MV&E regime and therefore the likelihood of meeting overall objectives of the programme.

- While it is important to monitor all transgressions including the number of minor transgressions of reported non-compliance, rates will tend to overstate the severity of the problem and may lead to erroneous conclusions. As a result, any reporting should clearly state what types of non-compliance are included and excluded.

Communication tasks

- Individual administrators will need to make their own assessment of the risks and benefits of reporting. Since different audiences will have different expectations of compliance rates, programmes need to develop a strategy for reporting which differentiates between the information provided.

- Although programmes and governments may be concerned by the release of frank assessments of compliance rates, this needs to be balanced against the benefits, which include:

  - Gaining increased support for MV&E activities in order to build a culture that strives for achievement in compliance;

  - Identifying cost-effective opportunities to increase the financial, energy saving and environmental achievements of the programme;

  - Highlighting to participants that compliance is taken seriously by administrators and governments and is being addressed through specific activities.

9 Evaluation & its Relationship to Compliance
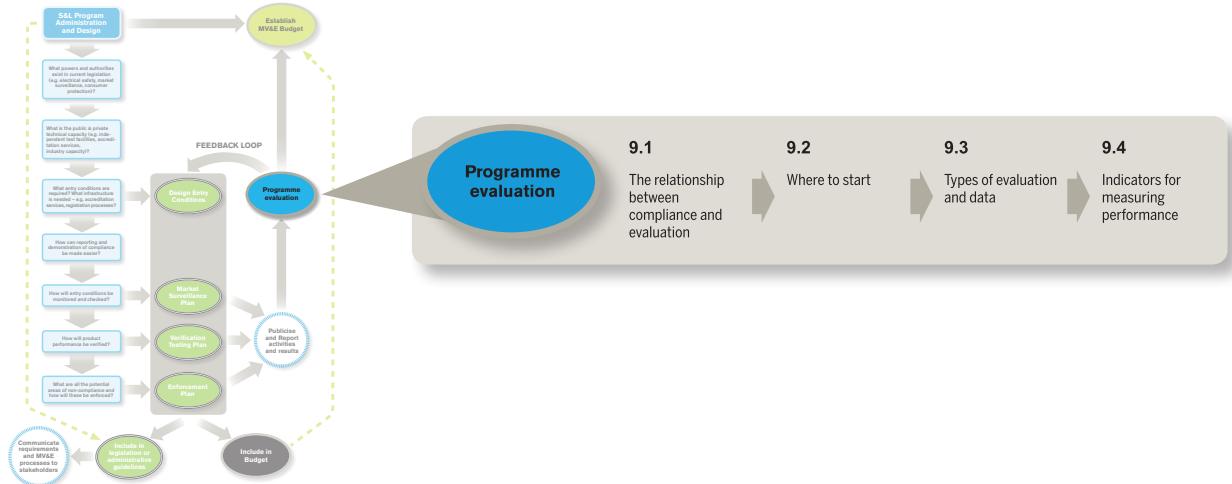
Evaluation is an essential component of any programme and particularly where public funding is involved. Through evaluation, it is possible to determine whether a programme has achieved or is achieving its goals. As such, evaluation provides the information necessary to convince all stakeholders to support S&L programmes, financially or otherwise.

Evaluation also provides information that allows programme administrators to address issues, both during programme implementation and post implementation, to improve future programme outcomes.

Although the results of programme monitoring are often used in evaluation exercises, the two are different. Monitoring is ongoing and occurs regularly throughout programme implementation. Evaluation occurs at discrete times during a programme's life-cycle, for example at the end of implementation or at a specified point.

This chapter explores the relationship between compliance and evaluation, highlighting the linkages between the two and briefly outlining the methodologies evaluation. (The benefits of evaluation in relation to the different types of entry conditions are discussed in Chapter 4 of this Guide).

9.1 The relationship between compliance and evaluation

Programme evaluation

The MV&E process itself generates much of the data needed in order to undertake an evaluation exercise, and the accuracy of the overall assessment will reflect the quality of this compliance information. This applies most obviously to energy performance information, but is also true for market data and non-energy related characteristics.

All evaluations of the impact of a programme make assumptions regarding the rate of compliance amongst products covered by the programme criteria. Clearly a programme with a stronger MV&E regime will expect to have a higher rate of compliance than one with a weaker regime. However, reasonable estimates of compliance rates can only be made only where there is sufficient information from MV&E processes.

In the absence of solid information on compliance rates, programmes may assume that 100% of products entering a market regulated for energy efficiency will meet the criteria for energy performance. In reality, it is unlikely that all products will reach this threshold, while some products may exceed the criteria by a considerable margin.

Similarly, data collected on the non-energy related characteristics of products entering the market is often useful in programme evaluation to explain changes in energy performance. For example, a record of the trend towards larger televisions may be needed to explain why observed improvement in unit energy consumption of LCD TVs has not progressed as quickly as forecast.

These are amongst the many reasons why compliance and evaluation are linked, and why effective compliance regimes enable programme evaluation to be more accurate.

9.2 Where to start

Programme evaluation

Evaluation should never be an afterthought; it needs to be planned and budgeted for, and the appropriate data collection strategy implemented. While a significant number of programme evaluations have been undertaken for S&L Programmes, the coverage and methodology have been largely inconsistent.

The benefits of good evaluation are now being recognised and it is accepted practice that programmes undergo evaluation. Evaluation begins in the early stages of programme development by:

- Developing a strategy for evaluation and data collection;

- Allocating resources to the implementation of the evaluation strategy.

This strategic planning process leads to a series of queries which need to be addressed in order to make up an assessment of how an energy efficiency programme has performed. In the first instance, these questions may be quite broad and generic, for example:

- *What were the aims and objective of the programme?*

- *What specific outcomes were expected from the programme and over what time period?*

- *Have these outcomes been realised or exceeded?*

- *If not, why not?*

- *Have other outcomes been observed?*

- *How much has the programme cost the stakeholders, individually and collectively?*

9.3 Types of evaluation and data

Programme evaluation

While most of these research questions relate to programme outcomes, some of the items that can actually be observed and measured concern the processes used to implement the programme. In many cases, these processes act as a proxy for the outcomes of the programme, and measuring these may be easier than trying to evaluate outcomes directly.

As a result, most types of evaluation can be separated into two main groups: impacts, and processes. Some common components of evaluation exercises are as follows (note that these are <u>not</u> mutually exclusive):

- Assesses the impacts and co-benefits that result directly from a programme (IMPACT);

- Assesses how efficiently a programme was/ is being implemented (PROCESS);

- Estimates influence on encouraging future energy efficiency projects because of changes in the marketplace (IMPACT);

- Cost-effectiveness, which is usually viewed as an extension of Impact Evaluation, but may also take into account market evaluation results considering the market penetration over the expected lifetime of the measures (IMPACT).

Most regulatory S&L programs require impact assessments prior to approval by governments, and this is known as 'ex-ante' evaluation because it occurs before programme implementation. Evaluation of a programme's performance is called 'ex-post', since it is conducted once the programme is operating, or once it is completed.

9.4 Indicators for measuring performance

Programme evaluation

In order to have the information necessary to perform an evaluation, all programmes need to collect data on key performance indicators (KPIs), which will assist them in assessing the performance of their MV&E regime.

Many KPIs will be affected by other market forces in a dynamic market environment, and this limits the accuracy of assessing the benefits of a compliance regime. For example, the performance of many internationally traded products may be the result of programmes in other markets. Additionally, there is often difficulty in establishing a 'control' group against which to measure improvement.

As a result, it is likely that programmes will need to make a range of qualitative as well as quantitative observations in order to develop an understanding of the performance and benefits of a compliance regime.

In doing so, consideration should be given to estimating the baseline for the selected indicators, i.e. to what extent would these measures have changed due to factors outside the influence of the programme. Separating out these other effects is complex. However, some consideration needs to be given to the selection of a control, or proxy for a control, to gain some view of the impact of the programme.

The following list is a guide to some of the KPIs that can form part of this assessment process.

Product performance

- Improvements in average energy performance , and sales-weighted average, of products within the programme;

- Improvements in average energy performance, and sales-weighted average, of products outside the programme (where relevant, for example in voluntary programmes);

- Improvements in the highest and lowest efficiencies of products inside and outside the programme (where relevant);

- Changes in other technical attributes, for example: size, volume, water use, etc.

Product prices

- Changes in average domestic wholesale and retail price of products within the programme;

- Changes in average domestic wholesale and retail price of products outside the programme (where relevant);

- Changes in prices of equivalent sold overseas;

- Changes in average domestic manufacturing cost of products within and outside the programme ;

- Changes in the CPI or similar indicator of consumer prices.

Rate and nature of non-compliance

- The number of products found to be non-compliant;

- The type of transgression, i.e. administrative, energy performance;

- The degree of transgression, i.e. by how much did the discovered performance differ from the programme criteria.

Some care must be taken in interpreting the results of this data, since higher detection rates may be the result of an increased prevalence of non-compliance or more effective detection. Where processes have been utilized to target monitoring those products most at risk of non-compliance, the share of non-compliant products discovered will be higher than the overall rate.

The relative seriousness of detected non-compliance is also relevant. For example, if more of the detected non-compliance is marginal or 'technical', then consumers are deriving more benefit than if more of the detected non-compliance is substantive.

Quantity of each type of enforcement response

- The number of products subject to remedial or enforcement action;

- The level of response taken in each instance and the total share of responses at each level.

Much care needs to be taken to ensure accurate interpretation of the results of this data, since a higher proportion of lower level responses may not necessarily indicate that higher levels of response are not warranted.

Level of awareness amongst industry participants

- The overall level of awareness of the programme and its requirements amongst industry participant.

Levels of consumer awareness and value of the regulation

- The level of consumer knowledge and attitudes towards the programme.

9.4.1 Sharing evaluation information

The key drivers for conducting evaluation are to learn lessons from programme development and implementation, and to assess programme outcomes against programme objectives.

If evaluation can be carried out in a manner that allows comparison of results between programmes, then the learning is enhanced. Sharing of lessons learned could cover a wide range of programme areas, for example:

- Programme results – such as energy savings achieved, market change and supplier challenges;

- Budget allocation for various elements – including evaluation;

- Implementation methodology – such as what worked and what didn't.

Consultation may be required with other programme administrators during the development of the evaluation strategy to help design methodologies and allow comparison and sharing of information.

9.5 Key messages

Golden rule:

- Programme evaluation provides information for administrators to enable them to understand what happened during implementation; identify ways to improve current and future programmes, and measure the outcomes achieved from a programme. It also provides information that can be used to promote energy efficiency as a serious cost-effective and accountable policy worthy of further investment.

- **Applying a strong compliance regime and measuring actual compliance allows a programme administrator to use real figures in programme evaluation – eliminating the risk that programme achievement is over (or under) calculated.**

- **In a dynamic market environment product characteristics will be affected by other market forces, and this limits the accuracy of assessing the programmatic impacts. As a result it is likely that programmes will need to make a range of qualitative as well as quantitative observations in order to develop an understanding of the performance and benefits of a compliance regime.**

Communication tasks

- There is value in sharing evaluation results. If evaluation is carried out in a manner that allows comparison of results between programmes, then lessons learned can be shared - including lessons about implementation, what worked and what did not, budget allocation and actual programme outcomes.

- Communicating evaluation results is likely to enhance the sense of ownership in programmes amongst all participants.

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International and National Contacts

GLOBAL		
International	Collaborative Labelling and Appliance Standards Program (CLASP)	http://www.clasponline.org
International	Efficiency Electrical End-Use Equipment (4E), IEA Implementing Agreement	http://www.iea-4e.org
International	Energy Foundation	http://www.ef.org
International	Intergovernmental Panel on Climate Change	http://www.ipcc.ch
International	International Energy Agency	http://www.iea.org
International	International Electrotechnical Commission (IEC)	http://www.iec.ch
International	International Institute for Energy Conservation (IIEC)	http://www.iiec.org
International	International Laboratory Accreditation Cooperation (ILAC)	http://www.ilac.org
International	International Organization for Standardization (ISO)	http://www.iso.ch
International	Organisation for Economic Co-operation and Development	http://www.oecd.org
International	United Nations Development Programme (UNDP)	http://www.undp.org
International	U.S. Agency for International Development (USAID)	http://www.undp.org

International	World Standards Services Network	http://www.wssn.net
International	The World Bank Group	http://www.worldbank.org

EUROPE		
General	CEECAP: Central and Eastern European Countries Appliance Policy	www.ceecap.org.
Switzerland	SFOE: Swiss Energy and Swiss Federal Office of Energy	http://www.bfe.admin.ch
Turkey	Ministry of Industry and Trade (MIT), Turkey	http://www.sanayi.gov.tr
Turkey	TSE: Turkish Standard Institute	http://www.tse.org.tr
Turkey	General Directorate of Electrical Power Resources Survey and Development Administration (EIE	http://www.eie.gov.tr
UK	Market Transformation Programme	http://efficient-products.defra.gov.uk/cms/market-transformation-programme
UK	Energy Saving Trust	http://www.energysavingtrust.org.uk
UK	The Carbon Trust	http://www.carbontrust.co.uk

NORTH AMERICA		
Canada	Canadian Standards Association	http://www.csa.ca
Canada	EcoLogo	http://www.environmentalchoice.com
Canada	EnerGuide	http://oee.nrcan.gc.ca/energuide
Canada	Energy Star	http://oee.nrcan.gc.ca/energystar
Canada	Office of Energy Efficiency	http://oee.nrcan.gc.ca
Mexico	General Directorate of Standards of the Ministry of the Economy, Mexico	http://www.economia-noms.gob.mx/noms/inicio.do
Mexico	FIDE: Trust for Saving Electrical Energy	http://www.fide.org.mx
Mexico	CONUEE: The National Commission for Energy Efficiency	http://www.conae.gob.mx/wb/CONAE
Mexico	ANCE: Asociación de Normalización y Certificación, A.C.	http://www.ance.org.mx
Mexico	Ministry of the Economy	http://www.economia.gob.mx
USA	ACEEE	http://www.aceee.org
USA	Association of Home Appliance Manufacturers (AHAM)	http://www.aham.org
USA	Alliance to Save Energy	http://ase.org
USA	A2LA: American Association for Laboratory Accreditation	http://www.a2la.org
USA	ANSI: American National Standards Institute	http://web.ansi.org
USA	ASAP: Appliance Standards Awareness Project	http://www.standardsasap.org
USA	ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers	http://www.ashrae.org
USA	California Energy Commission	http://www.energy.ca.gov

Resources

USA	Consortium for Energy Efficiency	http://www.cee1.org
USA	Department of Energy: Appliances and Commercial Equipment Standards	http://www1.eere.energy.gov/buildings/appliance_standards
USA	EERE: DOE Office of Energy Efficiency and Renewable Energy	http://www.eere.energy.gov
USA	Energy Star	http://www.energystar.gov
USA	Federal trade Commission	http://www.ftc.gov/bcp/conline/edcams/eande/index.html
USA	LBNL: Lawrence Berkeley National Laboratory	http://www.lbl.gov
USA	RAP: Regulatory Assistance Project	http://www.raponline.org

ASIA-PACIFIC		
General	APEC Energy Standards Information System	http://www.apec-esis.org
General	APEC Energy Working Group	http://www.ewg.apec.org
General	APERC: APEC Asia Pacific Energy Research Centre	http://www.ieej.or.jp/aperc
General	APLAC: Asia Pacific Laboratory Accreditation Cooperation	http://www.aplac.org
General	Asia-Pacific Partnership on Clean Development and Climate	http://www.asiapacificpartnership.org
General	Eco Asia: US AID Environmental Co-operation Asia	http://usaid.eco-asia.org
General	UNESCAP: UN Economic and Social Commission for Asia and the Pacific	http://www.unescap.org
Australia	ACCC: Australian Competition & Consumer Commission	http://www.accc.gov.au
Australia	Australian Appliance Standards and Labelling Programs	http://www.energyrating.gov.au
Australia	National Association of Testing Authorities	http://www.nata.asn.au
Australia	Standards Australia	http://www.standards.org.au
Australia	WELS: Water Efficiency Labelling and Standards Scheme	http://www.waterrating.gov.au
China	AQSIQ: General Administration of Quality Supervision, Inspection and Quarantine	http://www.aqsiq.gov.cn
China	China Sustainable Energy Program	http://www.efchina.org
China	CNCA: Certification and Accreditation Administration of the People's Republic of China	http://www.cnca.gov.cn/cnca
China	CNISL China National Institute of Standardization	http://www.cnis.gov.cn
China	CQC: China Quality Certification Center	http://www.cqc.com.cn
China	CSC: China Standard Certification Center	http://www.cecp.org.cn
China	SAC: Standardization Administration of the Peoples Republic of China	http://www.sac.gov.cn
Hong Kong	The Hong Kong Green Label Scheme	http://www.greencouncil.org
India	BEE: Bureau of Energy Efficiency	http://www.bee-india.nic.in
India	BIS: Bureau of Indian Standards	http://www.bis.org.in
India	MOP: Ministry of Power	http://powermin.nic.in

India	SIRIM Berhard	http://www.sirim.my
Indonesia	Directorate General of Electricity and Energy Utilization	http://www.djlpe.esdm.go.id
Indonesia	Ministry of Energy and Mineral Resources	http://www.esdm.go.id
Indonesia	SNI: Indonesian National Standard	http://www.bsn.go.id
Japan	ECCJ: Energy Conservation Centre of Japan	http://www.asiaeec-col.eccj.or.jp
Japan	Energy Star	http://www.eccj.or.jp
Japan	JISC: Japan Industrial Standards Committee	http://www.jisc.go.jp
Japan	JSA: Japanese standards Association	http://www.jsa.or.jp
Japan	METI: Ministry of Economy, Trade and Industry	http://www.meti.go.jp
Korea	Korea Testing Laboratory	http://www.ktl.re.kr
Korea	KATS: Korean Agency for Technology and Standards	http://www.ats.go.kr
Korea	KEMCO: Korea Energy Management Corporation	http://www.kemco.or.kr
Korea	Korean Eco Label Program	http://www.koeco.or.kr
Malaysia	Department of Standards	http://www.standardsmalaysia.gov.my
Malaysia	Energy Commission (Suruhanjaya Tenaga)	http://www.st.gov.my
Malaysia	Malaysian Energy Centre: Pusat Tenaga Malaysia	http://www.ptm.org.my
New Zealand	EECA: Energy Efficiency Conservation Authority	http://www.eeca.govt.nz
New Zealand	Standards New Zealand	http://www.standards.co.nz
New Zealand	The Building Research Association of New Zealand	http://www.branz.co.nz
Philippines	BPSLAS: Bureau of Product Standards Laboratory Accreditation Scheme	http://www.bps.dti.gov.ph
Philippines	PPSQF: Philippine Product Safety and Quality Foundation	http://ppsqf.org
Singapore	Singapore Energy Labelling Scheme	http://www.nccc.gov.sg/energylabel
Singapore	Singapore Green Labelling Scheme	http://www.sec.org.sg
Singapore	SINGLAS: Singapore Laboratory Accreditation Scheme	http://www.sac-accreditation.gov.sg
Singapore	SPRING: Standards, Productivity and Innovation Board	http://www.spring.gov.sg
Sri Lanka	Energy Efficiency Labelling Scheme for Electrical Appliances	http://www.slsi.lk/energy-labeling.php
Sri Lanka	SLSI: Sri Lanka Standards Institution	http://www.slsi.lk
Thailand	DEDE: Department of Alternative Energy Development and Efficiency	http://www.dede.go.th
Thailand	EGAT: Electricity Generating Authority of Thailand	http://www.egat.co.th
Thailand	EPPO: Energy Poicy & Planning Office	http://www.eppo.go.th
Thailand	Thai Green Labelling Scheme	http://www.tei.or.th
Thailand	TISI: Thai Industrial Standards Institute	http://www.tisi.go.th
Vietnam	STAMEQ: Directorate for Standards and Quality	http://www.tcvn.gov.vn/

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Appendix 1: ILAC Accredited bodies

The International Laboratory Accreditation Cooperation (ILAC) is an international cooperation of laboratory and inspection accreditation bodies formed remove technical barriers to trade. Through bi-lateral and multi-lateral agreements, ILAC established a network of mutual recognition arrangements to support international trade by promoting international confidence and acceptance of accredited laboratory data.

COUNTRY	ACCREDITATION BODY
Argentina	Organismo Argentino de Acreditacion (OAA)
Australia	National Association of Testing Authorities, Australia (NATA)
Austria	Bundesministerium fur Wirtschaft und Arbeit (BMWA)
Belgium	Belgian Accreditation Structure (BELAC)
Brazil	Diretoria de Credenciamento e Qualidade/Instituto Nacional de Metrologia (INMETRO)
Canada	Standards Council of Canada (SCC)
Canada	Canadian Association for Laboratory Accreditation Inc. (CALA)
People's Republic of China	China National Accreditation Service for Conformity Assessment (CNAS)
Costa Rica	Ente Costarricense de Acreditacion (ECA)
Cuba	National Accreditation Body of Republica de Cuba (ONARC)
Czech Republic	Czech Accreditation Institute (CAI)
Denmark	Danish Accreditation (DANAK)
Egypt	National Laboratories Accreditation Bureau (NLAB)
Finland	Finnish Accreditation Service (FINAS)
France	Comite Francais d' Accreditation (COFRAC)
Germany	Deutsches Akkreditierungssystem Prufwesen (DAP)
Germany	Deutsche Akkreditierungsstelle (DACH)
Germany	Deutecher Kalibrierdienst (DKD)
Germany	Deutsche Akkreditierungsstelle Technik GmbH (DATech)
Greece	Hellenic Accreditation System S.A. (ESYD)
Guatemala	Oficina Guatemalteca de Acreditacion (OGA)
Hong Kong,	China Hong Kong Accreditation Service (HKAS)
India	National Accreditation Board for Testing and Calibration Laboratories (NABL)

Indonesia	National Accreditation Body of Indonesia (KAN)
Ireland	The Irish National Accreditation Board (NAB)
Israel	Israel Laboratory Accreditation Authority (ISRAC)
Italy	Sistema Nazionale per l'Accreditamento di Laboratori (SINAL)
Italy	Servizio di Taratura in Italia (SIT)
Japan	Japan Accreditation Board for Conformity Assessment (JAB)
Japan	International Accreditation Japan (IA Japan)
Japan	Voluntary EMC Laboratory Accreditation Center (VLAC)
Republic of Korea	Korea Laboratory Accreditation Scheme (KOLAS)
Malaysia	Department of Standards Malaysia (DSM)
Mexico	entidad mexicana de acreditacion a.c. (ema)
The Netherlands	Dutch Accreditation Council (RvA)
New Zealand	International Accreditation New Zealand (IANZ)
Norway	Norwegian Accreditation (NA)
Philippines	Philippine Accreditation Office (PAO)
Poland	Polish Centre for Accreditation (PCA)
Portugal	Instituto Portugues de Acreditacao (IPAC)
Romania	Romanian Accreditation Association (RENAR)
Singapore	Singapore Accreditation Council (SAC)
Slovakia	Slovak National Accreditation Service (SNAS)
Slovenia	Slovenian Accreditation (SA)
South Africa	South African National Accreditation System (SANAS)
Spain	Entidad Nacional de Acreditacion (ENAC)
Sweden	Swedish Board for Accreditation and Conformity Assessment (SWEDAC)
Switzerland	Swiss Accreditation Services (SAS)
Chinese Taipei	Taiwan Accreditation Foundation (TAF)
Thailand	The Bureau of Laboratory Quality Standards, Department of Medical Sciences, Ministry of Public Health, Thailand (BLQS-DMSc)
Thailand	National Standardization Council of Thailand - Office of the National Accreditation Council (NSC-ONAC)
Thailand	Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Science and Technology (BLA-DSS)

Appendix 1

Tunisia	Tunisian Accreditation Council (TUNAC)
Turkey	Turkish Accreditation Agency (TURKAK)
United Kingdom	United Kingdom Accreditation Service (UKAS)
USA	American Association for Laboratory Accreditation (A2LA)
USA	National Voluntary Laboratory Accreditation Program (NVLAP)
USA	International Accreditation Service, Inc. (IAS)
USA	ANSI-ASQ National Accreditation Board doing business as ACLASS
USA	Laboratory Accreditation Bureau (L-A-B)
USA	Perry Johnson Laboratory Accreditation, Inc. (PJLA)
Vietnam	Bureau of Accreditation (BoA)

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