# Overview of the appliance and equipment training sessions

<table>
<thead>
<tr>
<th></th>
<th>Monday 14 October 2019</th>
<th>Tuesday 15 October 2019</th>
<th>Wednesday 16 October 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Introduction and roundtable</td>
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<td></td>
</tr>
<tr>
<td>1</td>
<td>Planning energy efficiency programmes</td>
<td>✓</td>
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<td>2</td>
<td>Selecting products for MEPS and Labelling programmes</td>
<td>✓</td>
<td></td>
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<tr>
<td>3</td>
<td>Assessing efficiency performance and setting MEPS</td>
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<td></td>
<td>Special - Regional harmonisation</td>
<td>✓</td>
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<td>4</td>
<td>Industry transformation</td>
<td>✓</td>
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<td>5</td>
<td>Stakeholder involvement and communication</td>
<td>✓</td>
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<tr>
<td>6</td>
<td>The relationship between product efficiency and price</td>
<td>✓</td>
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<tr>
<td>7</td>
<td>Modernising energy efficiency through digitalisation</td>
<td>✓</td>
<td></td>
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<tr>
<td>8</td>
<td>Insights into energy labels</td>
<td>✓</td>
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<tr>
<td>9</td>
<td>Monitoring, verification and enforcement</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>10</td>
<td>Evaluating policies and programmes</td>
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<td></td>
<td>Special - Available resources U4E</td>
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<tr>
<td>11</td>
<td>Roundtable discussion, review and report back</td>
<td></td>
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</table>
Resources – What is MV&E

Source: U4E

https://www.youtube.com/watch?v=u8xPFhcFYhw
You’ve been given $300,000 to improve compliance rates in your S&L programme

*How do you go about deciding on the most effective ways to spend this?*

*How would you spend this?*
Why is compliance important?

- Ensure that **consumer** receive the performance they are paying for.
- Ensure **suppliers** who invest more in energy efficiency do not lose market share to unscrupulous competitors.
- Ensure **governments** get the outcomes they expect (programme objectives).
- Safeguards the integrity of the programme – hard to win back confidence once lost.

Why is compliance important?
Group exercise

What are some of the ways to increase compliance rates?
What are the Options?

1. Test more products
2. Build a better laboratory
3. Better educate product suppliers
4. Publish list of offenders & actions taken
5. Inspect more labels in stores
6. Improved powers to act (legislation)
7. Improve the range of sanctions available
8. Publish rules / enforcement policy document
9. Make it easier for suppliers to demonstrate/report compliance
10. Improve targeting of testing
11. Develop in-house manual for staff
12. Publish testing targets in advance
13. Ensure that enforcement action is taken swiftly
14. Add requirements for retailers
Effective Compliance Frameworks aim to:

- Encourage Voluntary Compliance
- Deter Non-compliance
Steps to encourage voluntary compliance

- Stakeholders understand their obligations
- Simple to demonstrate compliance

Greater voluntary compliance
Encouraging Compliance

• Are the requirements for suppliers and retailers clear and accessible?
• Are they understandable (not ‘legalese’)
• Is registration (or alternatives) simple and effective, online, includes FAQ and guides?
• Is is clear what documentation is required?
• Are all the relevant documents relating to MV&E clearly identified on the website?
• Are enforcement procedures and sanctions obvious?
• Are all staff clear about their roles and responsibilities? e.g. Is there a staff ‘operations manual’?
• Are you reaching ‘new’ stakeholders as they enter the market?

Benefits

• Avoids time-consuming questions to busy staff
• Avoids wasting time on unresolved cases, delayed action
Example: Singapore
Example: MEPS Verification Process: Singapore

Example: Australia

Video: What suppliers need to know

How the E3 Program affects suppliers of products regulated for energy efficiency in Australia.

If you cannot see the video try viewing it on YouTube or download a transcript.

https://youtu.be/IOZ6RCXz18Q?t=19
Compliance Best Practice

- S&L compliance frameworks are designed to:
  
a) Encourage voluntary compliance, and

b) **Deter non-compliance**
Steps to deter non-compliance

**Deterrence theory:**

- **There must be a credible likelihood of detecting violations**
- **Swift, certain, and appropriate sanctions upon detection**
- **A perception among the regulated firms that these detection and sanction elements are present**

1. Increase the risk that instances of non-compliance will be discovered
2. Take corrective action quickly to minimise damage (to all)
3. Make penalties proportional to the extent of transgression but sufficient to be an effective deterrent
4. Ensure corrective action is visible - to deter others
Which is the better deterrent?

VISIBILITY IS IMPORTANT!
1. Increase the risk that non-compliance will be discovered

In most regulated markets:

- 20% of the regulated population will automatically comply with any regulation
- 5% will attempt to evade it
- and the remaining 75% will comply as long as they think that the 5% will be caught and punished.
1. Increase the risk that non-compliance will be discovered

- Market surveillance
- Verification testing
- Increase risk
- Communicate compliance activity
- Report enforcement action
Market Surveillance: labelling display and registration monitoring

• Periodically monitor products within a sample of stores to check that:
  - All required products are correctly labelled,
  - All labels conform to requirements,
  - Fake labels are not being used
  - Products on the market are registered (where required)

• Market surveillance can be undertaken by:
  - Government staff, Consumer groups, Contractors

• Respond to any observed instances of non-compliance & publish results

Benefit

• Early detection of labelling errors can avoid more serious non-compliance
• Demonstrates to suppliers and retailers that government is being vigilant
How to check label compliance? Example from India

- **Random sampling** – one model picked from the market – cost is borne by BEE
  - If model is **PASS** – process ends
  - If model is **FAIL**
    - **1st check testing**
      - If model is **FAIL**
        - **2nd check testing**
          - If model is **FAIL**
            - **Label withdrawn from the manufacturer and inform to SDA and advertising in newspaper**
          - If model is **PASS** – process ends
    - **BEE buys two models for Witness Testing** – cost is borne by manufacturer
      - If model is **PASS** – process ends
      - If model is **FAIL**
        - Direct manufacturer to correct the label level & changes information on advertising material
          - If manufacturer fails to comply
            - BEE will inform consumers about failure of model through Advertisement in newspaper and request to initiate penalty proceedings

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Published check testing results – Example from India
Verification testing

• Testing is expensive!

• Needed, but only worth it if:
  - It is done to required level of accuracy
  - Is defensible
  - Is acted upon

• Since you can only test a small proportion on models on the market – how do you increase cost-effectiveness?
  - Test products most likely to be non-compliant
  - Co-ordinate or share testing with other countries
  - Ensure tests are enforceable
Test products most likely to be non-compliant

- Random selection represents an inefficient allocation of resources
  - End up testing high proportion of compliant products

- Identify ‘risk factors’ for products most likely to be non-compliant and have most impact, e.g.
  - High market share
  - Does the brand have a good record of compliance?
  - What is the quality of evidence for claims – is the test lab known and credible?
  - Have competitors provided evidence of non-compliance?
  - Are the claims of performance excessively high - unbelievable?
Co-ordinate or share testing with other countries

- Numerous options to minimize costs and increase effectiveness:
  - Co-ordinate joint market surveillance with neighbouring economies
  - Share results of market surveillance to better target future actions
  - Use quality laboratories in neighbouring economies
  - Commission tests in product country of origin
Example – European surveillance coordination

- Various EU-wide (EU funded) projects

- EEPLIANT
  - 13 Market Surveillance Authorities (MSAs) from EU
  - Organises coordinated MV&E activities, including product testing of LEDs, printers and heaters
  - Electronic database allows MSAs to share plans and results of market surveillance activities in confidence
  - Publication of Best Practice Guide

- Industrial and Tertiary Product Testing and Application of Standards (INTAS)
2. Take corrective action quickly to minimise damage

- Any delay in taking corrective actions means non-compliant products remaining in the market
  - More energy savings lost
  - Higher household expenditure

- Most non-compliance can be quickly resolved, with minor enforcement
3. Make penalties proportional to the extent of transgression

Programmes need a range of enforcement tools
- To act appropriately and quickly to suspected transgressions to minimise damage
• Example - UK response to non-compliance

We operate in accordance with the Regulators’ Code, which requires us to:

- support compliance and growth
- engage with those we regulate
- base our activity on risk
- share information
- offer clear guidance
- be transparent.

We always act proportionately, depending on the nature of the non-compliance.

We are approachable and do not take enforcement action just because a business asks us a question or tells us that they have a problem.

Source: BEIS (2017)
4. Ensure corrective action is visible - to deter others

- Plans for compliance activity
- Results of market surveillance
- High Visibility
- Testing activity and results (once resolved)
- Enforcement actions taken
Reporting testing results

Results of Verification Testing of Registrable Goods
Under the Mandatory Energy Labelling Scheme

The National Environment Agency (NEA) carried out verification testing (VT) on a selection of air-conditioner, refrigerator and clothes dryer products registered under the Mandatory Energy Labelling Scheme (MELS). This report is the summary of the exercise, which was completed in July 2014.

Background

2 Under the Energy Conservation Act, suppliers of energy-using products are required to register their products with NEA, and ensure that products meet the specified energy performance standards. Suppliers test and report the energy performance of their products when they register them with NEA. These tests are based on internationally recognised standards or protocols. The energy efficiency of the product is determined using the laboratory testing system based on the results of these tests.

3 VT is a compliance monitoring process to ensure that the energy performance of products conforms to the performance requirements for MELS and safeguard the integrity of MELS and preserve consumer confidence in the labeling scheme. The VT process is described in Annex 1.

4 In this first VT exercise by NEA, about 5% of randomly selected models were tested. The selected models for VT were randomly selected, models with lower/medium energy efficiency ratings had a higher probability of selection, and a group of 3 from each product were subject to VT and the number of models tested.

Stage 1 VT Results

VT results were compared against suppliers' test reports submitted during registration. The energy performance of 87% (40 out of 46) of the registered goods tested were found to be within the allowable conformance limits (refer to Table 3 of Annex B). By appliance category, the compliance rates were 95% for air-conditioners, 75% for refrigerators and 100% for clothes dryers.

<table>
<thead>
<tr>
<th>No. of models tested</th>
<th>Air-conditioner</th>
<th>Refrigerator</th>
<th>Clothes Dryer</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of models that passed Stage 1 VT</td>
<td>19</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>No. of models that passed Stage 1 VT</td>
<td>1</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2: Summary of Stage 1 VT results
### Reporting enforcement actions

<table>
<thead>
<tr>
<th>Compliance Date</th>
<th>Product Type</th>
<th>Manufacturer</th>
<th>Model/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>18/05/2016</td>
<td>Air conditioner</td>
<td>SolAir World</td>
<td>SWW(R)-7.2GW</td>
</tr>
<tr>
<td>04/01/2016</td>
<td>Incandescent lamp</td>
<td>Olsent</td>
<td>ASS 28W</td>
</tr>
<tr>
<td>04/01/2016</td>
<td>Incandescent lamp</td>
<td>Olsent</td>
<td>28W Halogen Globe Dimmable Clear Fancy Round P45 28W</td>
</tr>
<tr>
<td>14/12/2015</td>
<td>Incandescent lamp</td>
<td>Olsent</td>
<td>Q35 MR16/CG/36 12V-35W F12T GUS.3 ELV Reflector</td>
</tr>
<tr>
<td>12/11/2015</td>
<td>Incandescent lamp</td>
<td>GE Lighting</td>
<td>Halogen GLS Lamp 100W 240V D0</td>
</tr>
<tr>
<td>05/11/2015</td>
<td>Incandescent lamp</td>
<td>Fozz</td>
<td>US.3 12V 25W 60* tungsten halogen ELV Reflector</td>
</tr>
<tr>
<td>05/11/2015</td>
<td>Air conditioner</td>
<td>Pioneer</td>
<td>GTO-100A6/GTE-100A6</td>
</tr>
<tr>
<td>22/09/2015</td>
<td>Incandescent lamp</td>
<td>Osramp</td>
<td>64543 A ECO 42W 240V D22D</td>
</tr>
<tr>
<td>22/09/2015</td>
<td>Incandescent lamp</td>
<td>Osramp</td>
<td>64544 A FR ECO 53W E27</td>
</tr>
<tr>
<td>11/09/2015</td>
<td>Self-ballasted compact fluorescent lamp</td>
<td>Olsent</td>
<td>3P414-ES-40K,</td>
</tr>
<tr>
<td>17/08/2015</td>
<td>Self-ballasted compact fluorescent lamp</td>
<td>EnviroLux</td>
<td>XEU48-1SR80 E27 2700K</td>
</tr>
<tr>
<td>13/08/2015</td>
<td>Self-ballasted compact fluorescent lamp</td>
<td>EnviroLux</td>
<td>XEU48-1SR80 E27 4000K</td>
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<td>30/07/2015</td>
<td>Self-ballasted compact fluorescent lamp</td>
<td>Olsent</td>
<td>FE-H5B-18W 2700K</td>
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<td>30/07/2015</td>
<td>Self-ballasted compact fluorescent lamp</td>
<td>Olsent</td>
<td>FE-AU-15W 2700K</td>
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<tr>
<td>09/07/2015</td>
<td>Self-ballasted compact fluorescent lamp</td>
<td>E-Star</td>
<td>ESSP9W27E27 8w Mini Twist warm white 6500K</td>
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<td>26/06/2015</td>
<td>Self-ballasted compact fluorescent lamp</td>
<td>Arlec</td>
<td>FT24</td>
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<tr>
<td>26/06/2015</td>
<td>Self-ballasted compact fluorescent lamp</td>
<td>Osram</td>
<td>Mini Twist 13W/827 E27</td>
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<td>11/06/2015</td>
<td>Self-ballasted compact fluorescent lamp</td>
<td>Philips</td>
<td>Ambiance A55 11W WW</td>
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<td>18/05/2015</td>
<td>Computer monitor</td>
<td>Philips</td>
<td>28AESQ</td>
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<td>05/01/2015</td>
<td>Double-capped fluorescent lamp</td>
<td>NEC</td>
<td>FL305SEX-N-HG : 36 : 30W T8 Tri-Phosphor Natural 5000K</td>
</tr>
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</table>

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Example: Suspended products Hong Kong
## Two types of testing models

<table>
<thead>
<tr>
<th></th>
<th>Post-market verification</th>
<th>Third-party certification</th>
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<tbody>
<tr>
<td><strong>Entry conditions</strong></td>
<td>Independent tests, in-house testing, calculation or self declaration</td>
<td>Third-party verification and/or certification</td>
</tr>
<tr>
<td>Government/Programme</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Industry Participant</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>Consumers</td>
<td>$</td>
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**Total costs ≈ same**
### Value of improving non-compliance

#### Assumptions

<table>
<thead>
<tr>
<th>Assumption</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Fridge market p.a.</td>
<td>200,000</td>
</tr>
<tr>
<td>Av. Energy consumption (kWh/year)</td>
<td>400</td>
</tr>
<tr>
<td>Non-compliance rate</td>
<td>15%</td>
</tr>
<tr>
<td>Extent of non-compliance</td>
<td>15%</td>
</tr>
<tr>
<td>Lifetime (years)</td>
<td>12</td>
</tr>
<tr>
<td>Cost of electricity ($/kWh)</td>
<td>0.2</td>
</tr>
</tbody>
</table>

#### Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducing non-compliance rate to 10%</td>
<td></td>
</tr>
<tr>
<td>Saving after one year</td>
<td>$1.44 million</td>
</tr>
<tr>
<td>Cost-benefit ratio (if $300k MVE programme), one year</td>
<td>1:4.8</td>
</tr>
<tr>
<td>Cumulative savings after ten years</td>
<td>$144 million</td>
</tr>
<tr>
<td>Value of lost electricity savings after one year</td>
<td>$4.32 million</td>
</tr>
<tr>
<td>Cumulative after ten years...</td>
<td>$430 million</td>
</tr>
</tbody>
</table>
The Value of Better Compliance – for $300k per year

$144m saved after 10 years, for $300k MVE programme
Scenario

- How would you spend $300,000 on improving compliance?

- [Write down on a piece of paper, not to share]
## What would I do?

<table>
<thead>
<tr>
<th>Item</th>
<th>$</th>
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</thead>
<tbody>
<tr>
<td>Dedicated compliance staff</td>
<td>110,000</td>
</tr>
<tr>
<td>- Drafting enforcement policy</td>
<td></td>
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<td>- Drafting internal procedures</td>
<td></td>
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<td>- Testing selection criteria</td>
<td></td>
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<tr>
<td>- Managing tests, reporting on results</td>
<td></td>
</tr>
<tr>
<td>- Organising legislative change if necessary</td>
<td></td>
</tr>
<tr>
<td>Highlight compliance on website, promotion of enforcement policy</td>
<td>25,000</td>
</tr>
<tr>
<td>Labelling survey</td>
<td>25,000</td>
</tr>
<tr>
<td>Round-robin tests</td>
<td>60,000</td>
</tr>
<tr>
<td>Compliance tests</td>
<td>80,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$300,000</strong></td>
</tr>
</tbody>
</table>
Essential elements of compliance regimes

- Mechanism to facilitate compliance
- Market surveillance
- Verification testing
- Enforcement
- Communication, reporting, feedback
- Legal and administrative framework
- Budget and resource allocation
- Evaluation processes
Example – Ghana - ENFORCEMENT OF Standards/Regulations

Approach:

- Submission of test reports for approval before importation of appliances
- Enforcement team stationed at the main entry ports
- Market surveillance
- Monitoring and inspection
- Installation of test facilities at GSA FOR TESTING
- Energy efficient appliance Database / mobile App.
- Enact Regulations to prohibit importation/sales of used appliances

Source: Ghana Energy Commission, Hubert Zan
Example – Ghana - ENFORCEMENT OF Standards/Regulations

- Adopting digitalization - HS codes used in enforcement
- Adopting a risk-based profiling to identify contraband (non-compliance).
- Enforcement fees – re-export
- Naming and shaming of non-compliance companies

Source: Ghana Energy Commission, Hubert Zan
• **ABOUT 2,884,863** USED FRIDGES IMPORTED SINCE 2005.

• **40,000** UNITS SEIZED SINCE 2013, AND **10,472** TURN-INS.

**FIGURE 1: TREND IN USED REFRIGERATING APPLIANCES IMPORTS (2005 – 2018)**

- **TOTAL IMPORTS**: The trend shows a significant decline from 2005 to 2018. The equation $y = \frac{23,904x + 228,477}{228,477}$ with $R^2 = 0.8653$ indicates the relationship between years and total imports.

- **TOTAL SAVINGS**: The graph illustrates a drop in total imports, leading to a savings of **3,624 GWh**.

- **ABOUT 3.0 M UNITS PROHIBITED B/N 2013 & 2018**: This is marked on the graph, with a downward arrow indicating the prohibition period.

- Drastic reduction in used fridge imports from 2013 due to the enforcement of L.I. 1932 and increase in the imports of the new fridges (L.I. 1958).

- B/N 2013 & 2018, NEW FRIDGES WOULD HAVE CONSUMED 489GWh instead of 1,757GWh, resulting in a saving of 1,268GWh.

Figure 2: Trends in New Versus Used Refrigerators Imports (2005 – 2018)
Sources of further information

CLASP

https://clasp.ngo

Sources of further information

United for Efficiency: Enforcing Lighting Regulations

https://united4efficiency.org/resources/enforcing-efficient-lighting-regulations/
Resources

- Cost of laboratories (SEAD report, 2019)
- What is MV&E

https://www.youtube.com/watch?v=u8xPFhcFYhw
# Performance testing of lighting products

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