Appliances & Equipment Stream: Day 3, Wednesday 4 May

Meet the team

Mel Slade

Head of Energy Efficiency in Emerging Economies (E4) Programme,
International Energy Agency

Kevin Lane

Head of Energy Efficiency Analyst Team,
International Energy Agency

Emily McQualter

Energy Efficiency Analyst in Emerging Economies (E4) Programme,
International Energy Agency

Charles Michaelis

Director of Strategy Development Solutions,
Strategy Development Solutions

Norma Morales

Director of Regulations in Energy Efficiency,
CONUEE

Virginia Zalaquett

Professor of the Diploma in Energy Efficiency,
Pontificia Universidad Católica de Chile

Nisla Sauri

Regulatory Expert,
LG Electronics Panama

Andika Hermawan

Energy Efficiency Analyst (Intern),
International Energy Agency

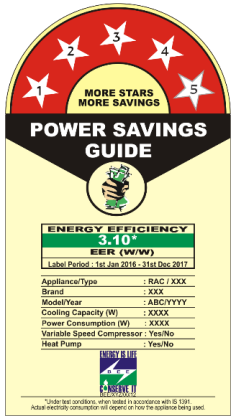
Learning outcomes – slide on what we are covering today

Appliance & Equipment Stream - Wednesday 4 May		
Time		**Activities**
Paris	Panama	
15.00 – 16.30	08.00 – 09.30	Opening Lecture: ▪ Understanding Energy Labels and Compliance
16.30 – 18.00	09.30 – 11.00	Self-study and Assignment: Quiz, and Exercise
18.00 – 19.00	11.00 – 12.00	Group Work ▪ Group Assignment: Awareness on energy labels and compliance mechanism
19:00 – 19:30	12.00 – 13.30	Group report back

Insights into Energy Labels

What are energy labels?

- When people buy an appliance they pay for an energy service in two parts:
    1. They can see the appliance, and its cost
    2. They cannot see the energy consumed, or its running costs
- Energy labels provide consumers with information on the energy efficiency and energy consumption of a product
- There are two main types of labels:
    1. Comparative
    2. Endorsement



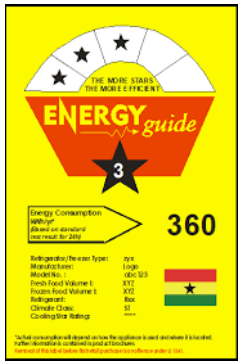
Comparative labels

- The labels help consumers to understand which products have the lowest total cost
- Energy label is attached to an appliance when it is displayed for sale: it tells people about the energy use before they buy
- Comparative labels may be voluntary, but mandatory labels are more common.
- Comparative labels usually communicate in two ways:
  - A quick visual rating
  - Detailed data e.g. actual kilowatt-hours (kWh), running costs, capacity/size

Dial

Bar

Ghana

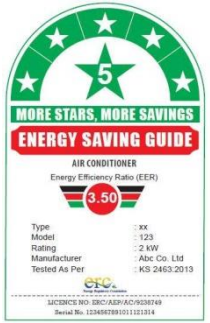


Thailand

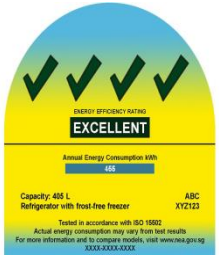
South Korea

Indonesia

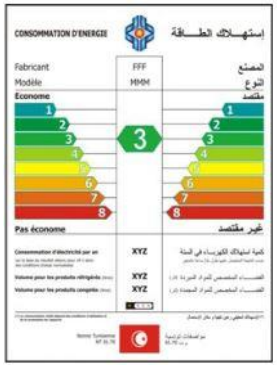
Kenya



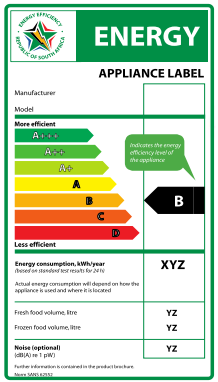
Singapore



Tunisia



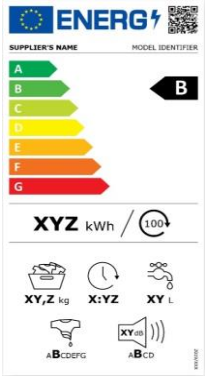
South Africa



Brazil

China

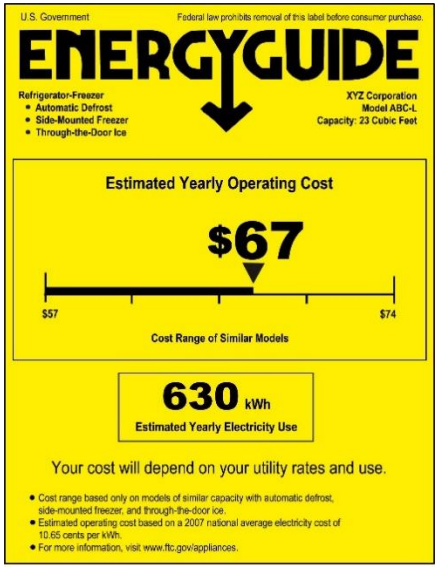
EU



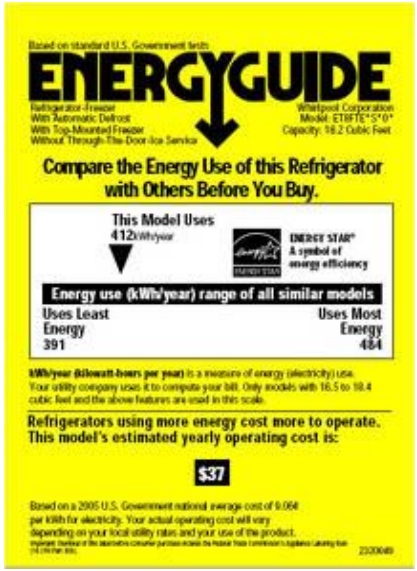
Continuous Comparative Labels

Continuous

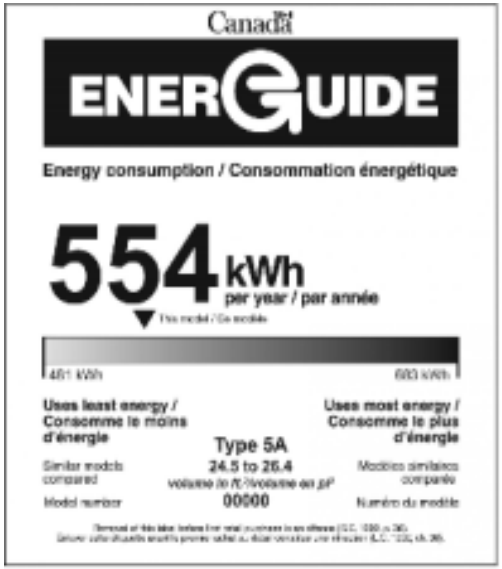
United States



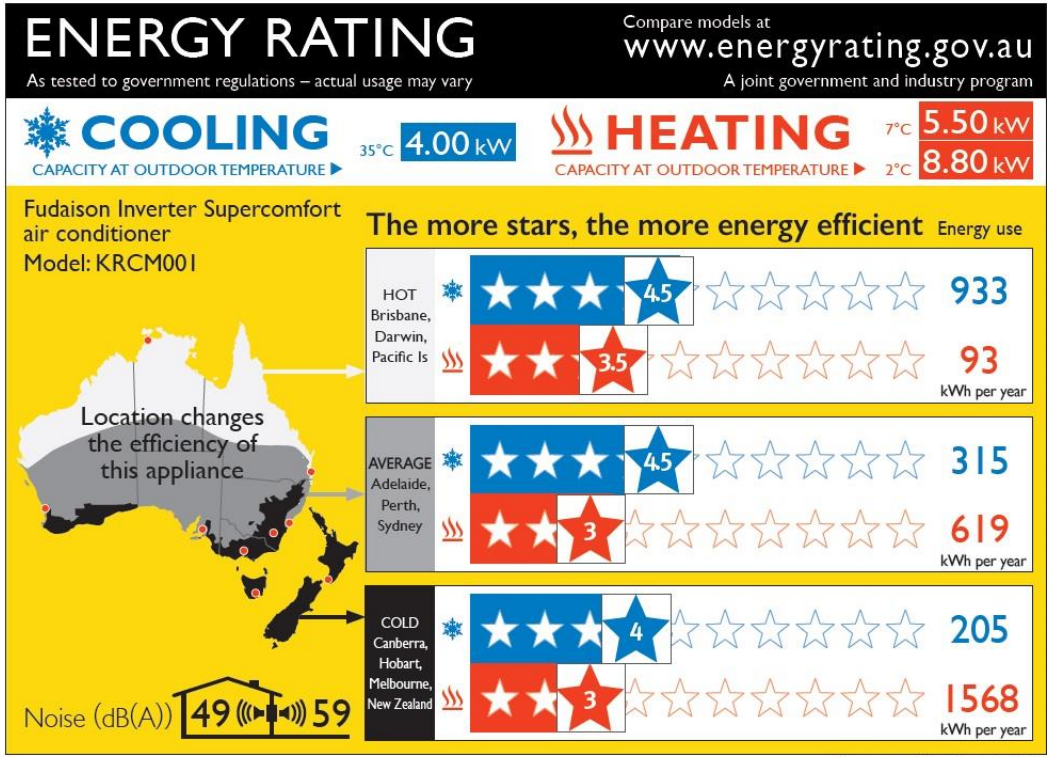
Philippines



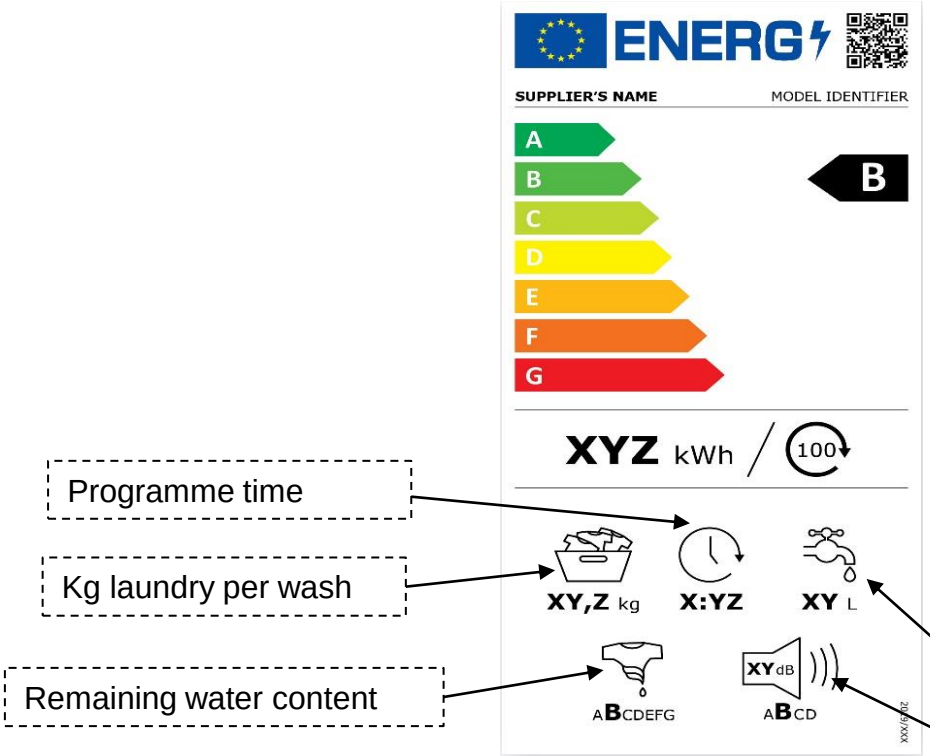
Canada



Zoned Energy Label



What information can be included? EU example



- Energy consumption
- Programme time
- Water consumption
- Power consumption in 'off-mode'
- Power consumption in 'left-on mode'
- 'left-on mode' duration
- Remaining moisture content
- Airborne acoustic noise emissions
- Maximum spin speeds.

Endorsement labels

- Identify the most energy efficient models, generally endorsement labels show no product specific information
- Endorsement labels are voluntary but have rules around their use which must be complied with
- Can be updated more rapidly than a comparative energy label
- Usually paid for by manufacturers and are third party tested
- Often linked to High Efficiency Performance Standards or HEPS which are in turn used for incentives

Label placement

Label placement

Label Design

The most effective labels are visually intuitive

Clear and easy to understand
Less information in better

Labels work in different ways to reflect cultures & different perceptions

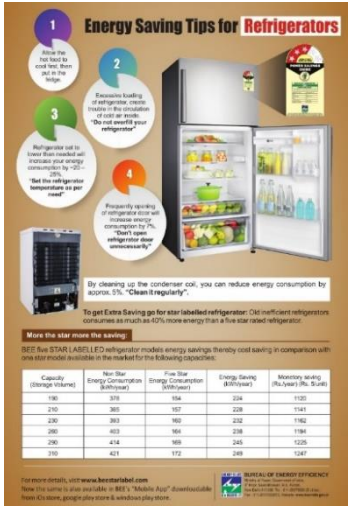
Letters vs numbers, language, left to right ranking

Pick one label design and stick to it

It takes years for buyers to become familiar with labels

Awareness-raising

- Effective labels require buyer awareness-raising campaigns
- Buyer purchasing decisions that favour energy-efficient and high quality products ultimately provide a “pulling” force in the market
- Encouraging consumers and others to buy products at the high end of efficiency and quality creates market demand (and drives down prices)
- Retailer training programmes have been successful in many countries



Awareness raising in schools in Tonga

Organised by

- Tonga Department of Energy
- Pacific Community's (SPC) Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE)

Stakeholders from

9 primary schools (700 students)

Purpose

Raise awareness about the energy rating label and promote energy saving behaviour

Awareness raising in schools in India

Organised by

- Bureau of Energy Efficiency
- National Power Training Institute

Stakeholders from

Retail companies (2000 retail shop staff in 18 training sessions in 6 cities)

Purpose

Enable retailers to support customers in making energy efficient decisions when purchasing appliances and equipment

Comparison Tools

PocketWatt
YOUR ENERGY EFFICIENCY GUIDE

Home PocketWatt Retailers Partners Roundtable News Publications Contact About PocketWatt Web English

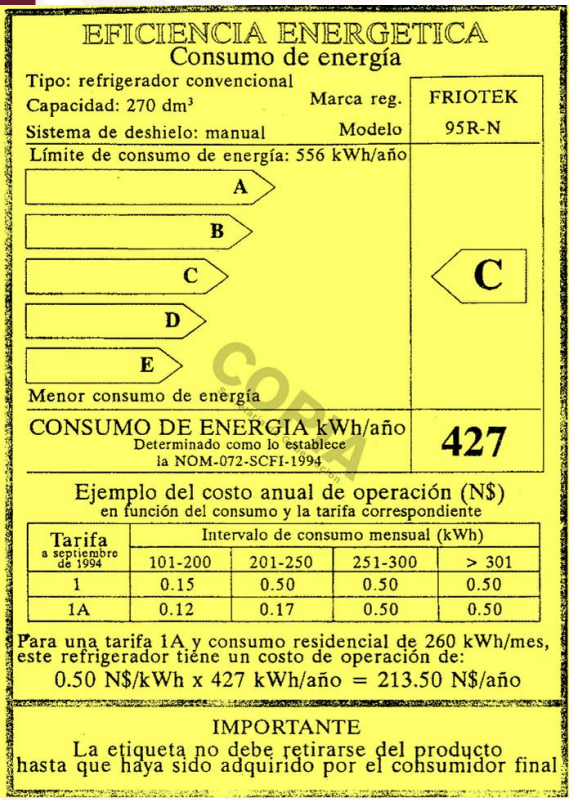
Label Awareness Raising

Energy Efficiency Labeling in Mexico

The regulatory framework in Mexico allows to place in a single document the minimum energy performance specifications, the test method and the commercial information.

Therefore, since the beginning of energy efficiency standardization, it was considered important to include labeling requirements, to allow consumers the comparison between the performance of different products.

First version of energy efficiency labels (1994)



EFICIENCIA ENERGETICA

Consumo de energía

Tipo: refrigerador convencional
Capacidad: 270 dm³
Sistema de deshielo: manual

Marca reg. FRIOTEK
Modelo 95R-N

Límite de consumo de energía: 556 kWh/año

A
B
C
D
E

C

Menor consumo de energía

CONSUMO DE ENERGIA kWh/año
Determinado como lo establece la NOM-072-SCFI-1994

427

Ejemplo del costo anual de operación (N$)
en función del consumo y la tarifa correspondiente

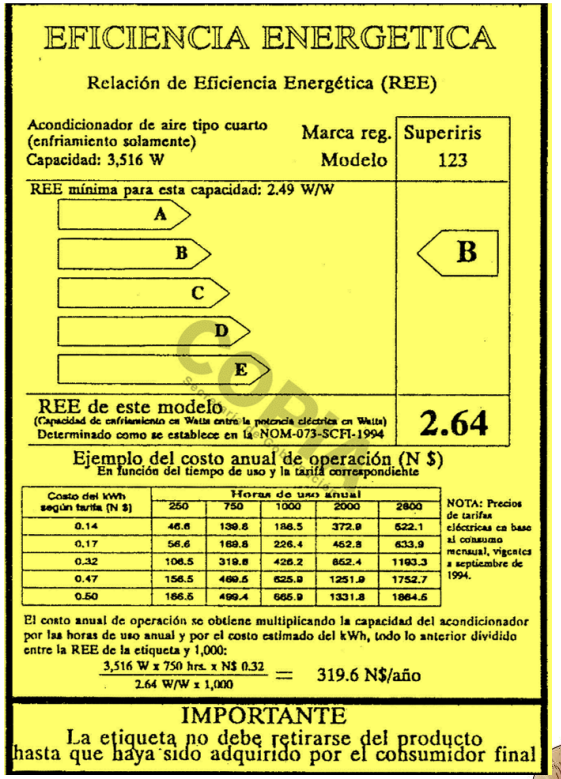
Tarifa a septiembre de 1994	Intervalo de consumo mensual (kWh)			
	101-200	201-250	251-300	> 301
1	0.15	0.50	0.50	0.50
1A	0.12	0.17	0.50	0.50

Para una tarifa 1A y consumo residencial de 260 kWh/mes, este refrigerador tiene un costo de operación de:

0.50 N$/kWh x 427 kWh/año = 213.50 N$/año

IMPORTANTE
La etiqueta no debe retirarse del producto hasta que haya sido adquirido por el consumidor final

NOM-072-SCFI-1994, Energy efficiency of refrigerator appliances. Limits, test methods and labeling.



EFICIENCIA ENERGETICA

Relación de Eficiencia Energética (REE)

Acondicionador de aire tipo cuarto (enfriamiento solamente)
Capacidad: 3,516 W

Marca reg. Superiris
Modelo 123

REE mínima para esta capacidad: 2.49 W/W

A
B
C
D
E

B

REE de este modelo
(Capacidad de enfriamiento en Watts entre la potencia eléctrica en Watts)
Determinado como se establece en la NOM-073-SCFI-1994

2.64

Ejemplo del costo anual de operación (N $)
En función del tiempo de uso y la tarifa correspondiente

Costo del kWh según tarifa (N $)	Horas de uso anual				
	250	750	1000	2000	2800
0.14	46.6	139.8	186.5	372.9	522.1
0.17	56.6	169.8	226.4	452.8	633.9
0.32	106.5	319.8	426.2	852.4	1193.3
0.47	156.5	469.5	625.9	1251.9	1752.7
0.50	166.5	499.4	665.9	1331.8	1864.5

NOTA: Precios de tarifas eléctricas en base al consumo mensual, vigentes a septiembre de 1994.

El costo anual de operación se obtiene multiplicando la capacidad del acondicionador por las horas de uso anual y por el costo estimado del kWh, todo lo anterior dividido entre la REE de la etiqueta y 1,000:

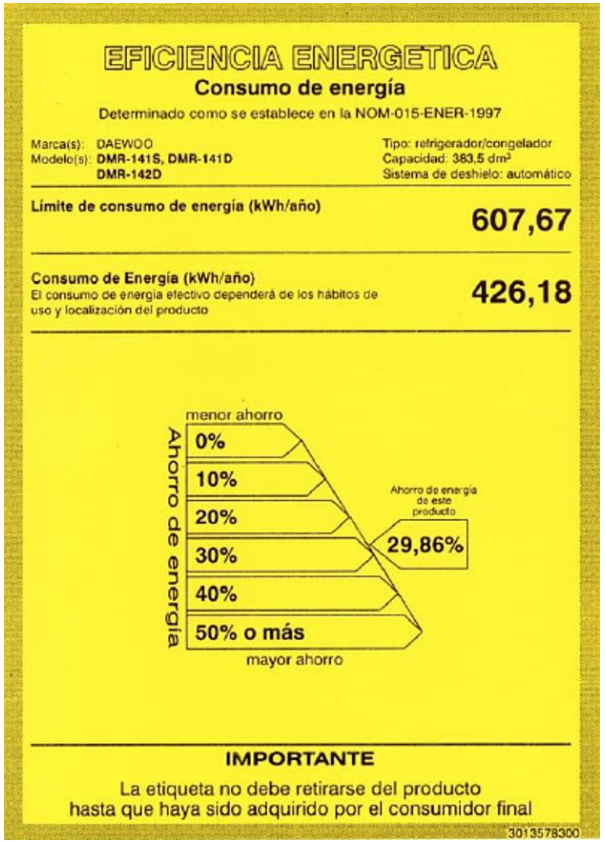
$$\frac{3{,}516\ \text{W} \times 750\ \text{hrs} \times \text{N\$}\ 0.32}{2.64\ \text{W/W} \times 1{,}000} = 319.6\ \text{N\$/año}$$

IMPORTANTE
La etiqueta no debe retirarse del producto hasta que haya sido adquirido por el consumidor final

NOM-073-SCFI-1994, Energy efficiency of room type air conditioners. Limits, test methods and labeling

Second version of the energy efficiency label (1997)

NOM-015-ENER-1997, Energy efficiency of refrigerators and freezers appliances. Limits, test methods and labeling.



Qualitative Study to Explore Consumer´s Comprehension of the Mexican Energy Efficiency Label (1/6)

This study was conducted at the end of **2002** and was carried out by the "Collaborating labeling and appliance standards program (CLASP)" and USAID, with the coordination of Conuee (before Conae)

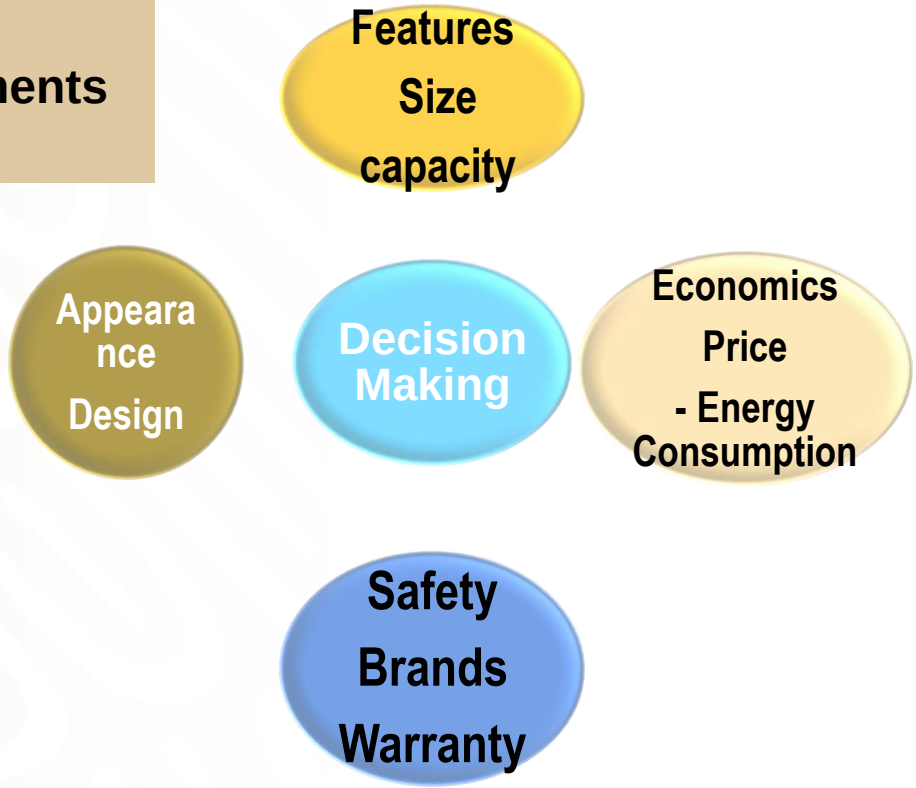
The objective of this evaluation was to identify the problems of understanding the label, to improve the design and its content (information) for better decision-making by consumers when purchasing products.

Qualitative Study to Explore Consumer´s Comprehension of the Mexican Energy Efficiency Label (2/6)

Six focus groups were formed, made up of women and men between in ages from 25 to 35 from different economic contexts. Which had bought or were going to buy some appliance, such as refrigerator, washing machine, air conditioner or water heater.

Qualitative Study to Explore Consumer´s Comprehension of the Mexican Energy Efficiency Label (3/6)

Criteria decision-making elements were evaluated:



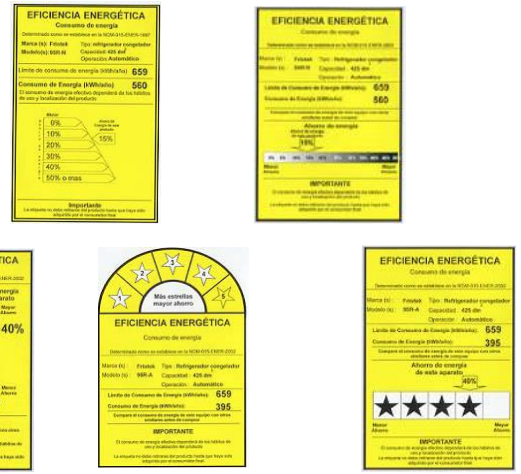
Qualitative Study to Explore Consumer´s Comprehension of the Mexican Energy Efficiency Label (4/6)

SENER SECRETARÍA DE ENERGÍA | CONUEE COMISIÓN NACIONAL PARA EL USO EFICIENTE DE LA ENERGÍA

Principal dimensions in evaluating labels

- Ease of understan
- Credibi lity
- Appe al
- Motivat ion

Labels evaluated



Qualitative Study to Explore Consumer´s Comprehension of the Mexican Energy Efficiency Label (5/6)

Understanding

Less Appealing

More Appealing

Confusing

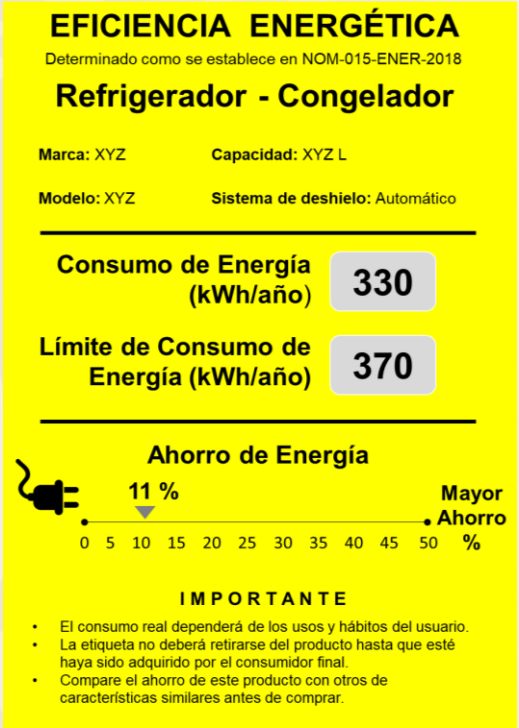
Qualitative Study to Explore Consumer´s Comprehension of the Mexican Energy Efficiency Label (6/6)

SENER SECRETARÍA DE ENERGÍA | CONUEE COMISIÓN NACIONAL PARA EL USO EFICIENTE DE LA ENERGÍA

Dependability/Credibility

Less

More



The energy efficiency label helps to:

- Identify that a product complies with a standard.
- Show the consumer the minimum efficiency or maximum energy consumption of the appliance or system that holds it.
- The consumer can make better purchasing decisions.
- Allows the marketer to show a higher efficiency value or lower energy consumption and display it on the label.

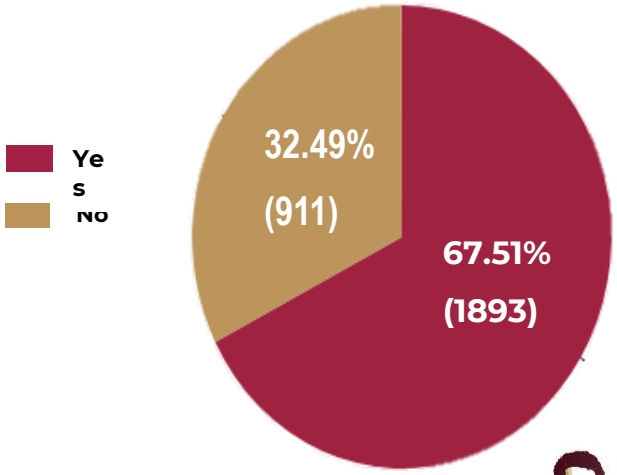
Energy Efficiency Label Survey

In October 2021, the digital Energy Efficiency Label Survey was carried out by Conuee.

The main objective of the survey was to measure how important is for the consumers the energy efficiency label.

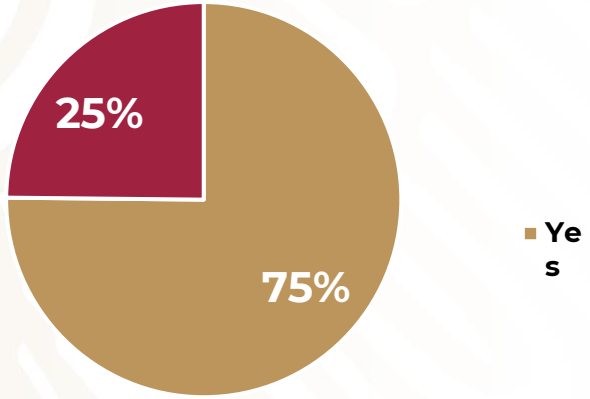
2084 surveys were completed.

About 70% reply they knew the label

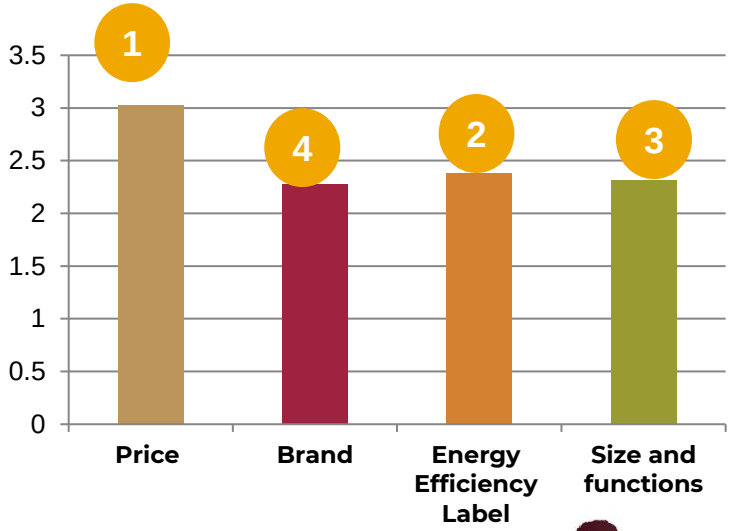


Energy Efficiency Label Survey

Of those who knew the label, 75% responded that they compared labels during the purchase of a product.



Priority of decision-making elements



Introduction to Compliance

Resources – What is Compliance

Question

What are some of the ways to increase compliance rates?

https://www.menti.com/r4ed7gyvio

Or

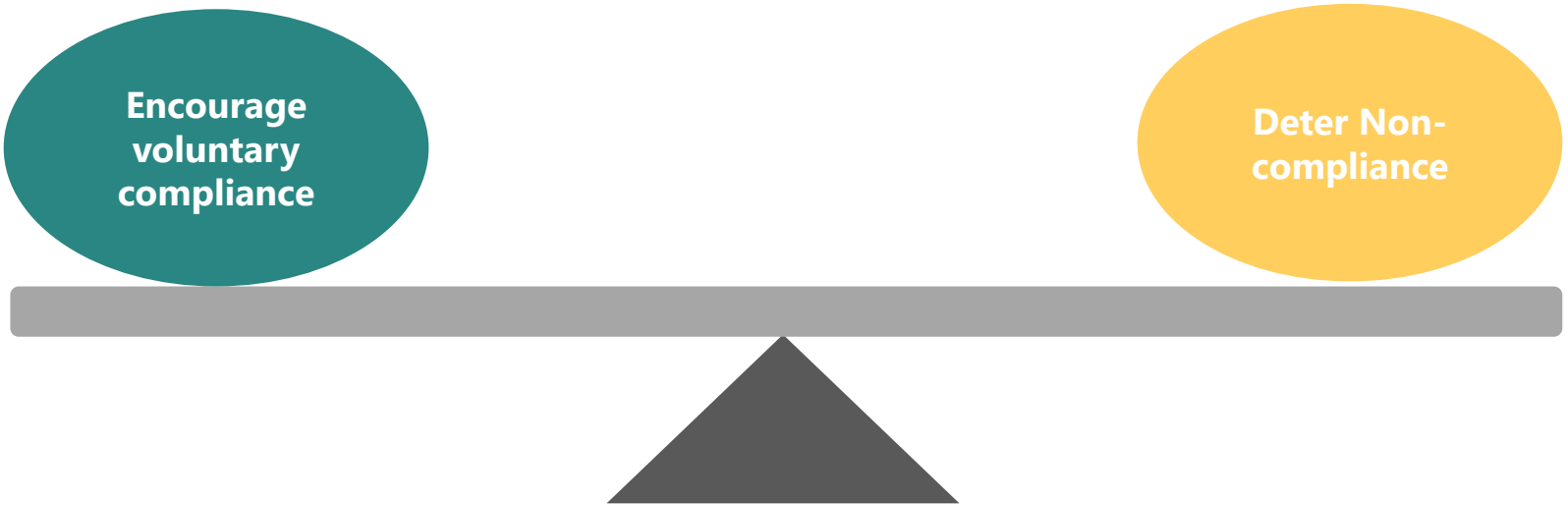
Go to www.menti.com and use the code **4875 8127**

What are the options?

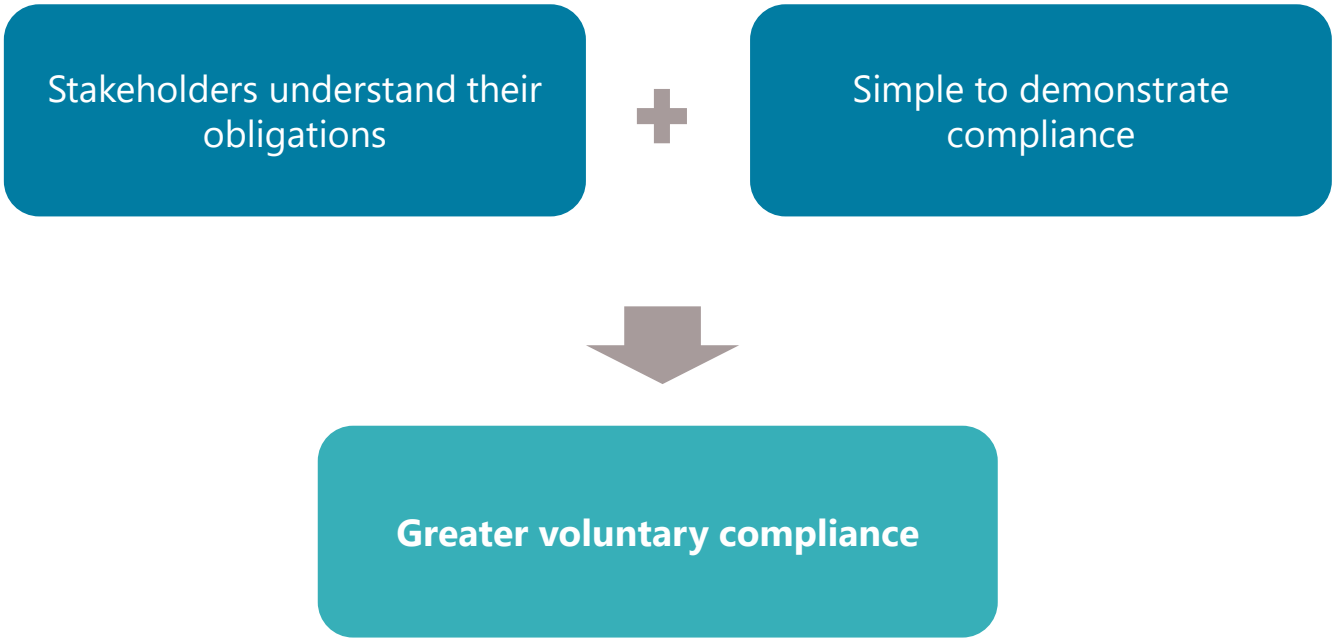
1. Test more products
2. Build a better laboratory
3. Better educate product suppliers
4. Publish list of offenders & actions taken
5. Inspect more labels in stores
6. Improved powers to act (legislation)
7. Improve the range of sanctions available
8. Publish rules / enforcement policy document
9. Make 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

Compliance Best Practice

Effective compliance frameworks aim to



Steps to encourage voluntary compliance



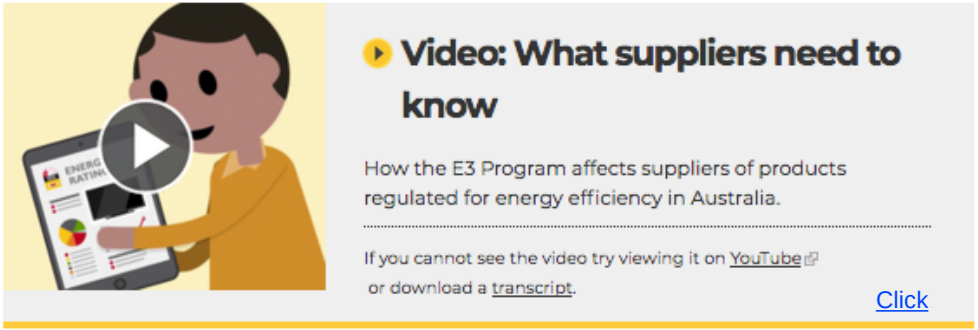
Encouraging Compliance

1. Are the requirements for suppliers and retailers clear and accessible?
2. Are they understandable (not ‘legalese’)
3. Is registration simple and effective, online, including FAQ and guides?
4. Is it clear what documentation is required?
5. Are all the relevant documents relating to compliance clearly identified on the website?
6. Are enforcement procedures and sanctions obvious?
7. Are all staff clear about their roles and responsibilities? e.g. Is there a staff ‘operations manual’?
8. 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: Australia



Compliance Best Practice

S&L compliance frameworks are designed to

- Encourage voluntary compliance, and
- **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?

VS

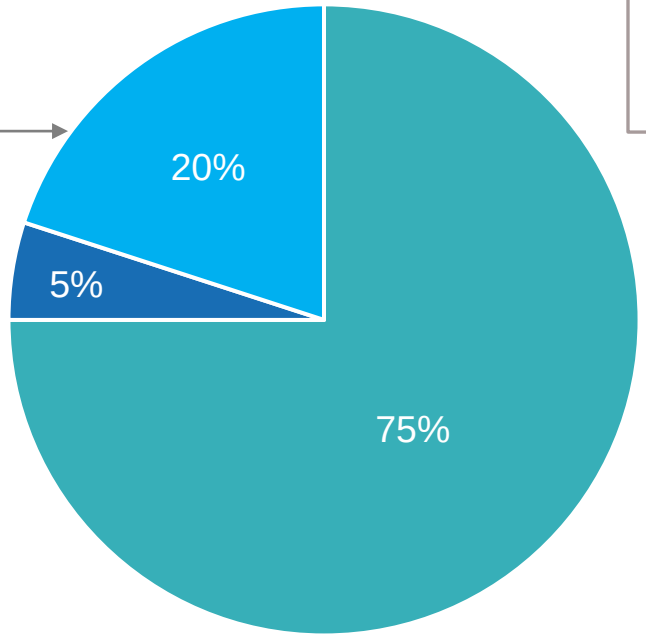
VISIBILITY IS IMPORTANT!

Increase the risk that non-compliance will be discovered

In most regulated markets

20% of the regulated population will automatically comply with any regulation

the remaining 75% will comply as long as they think that the 5% will be caught and punished



5% will attempt to evade it

Increase the risk that non-compliance will be discovered

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)

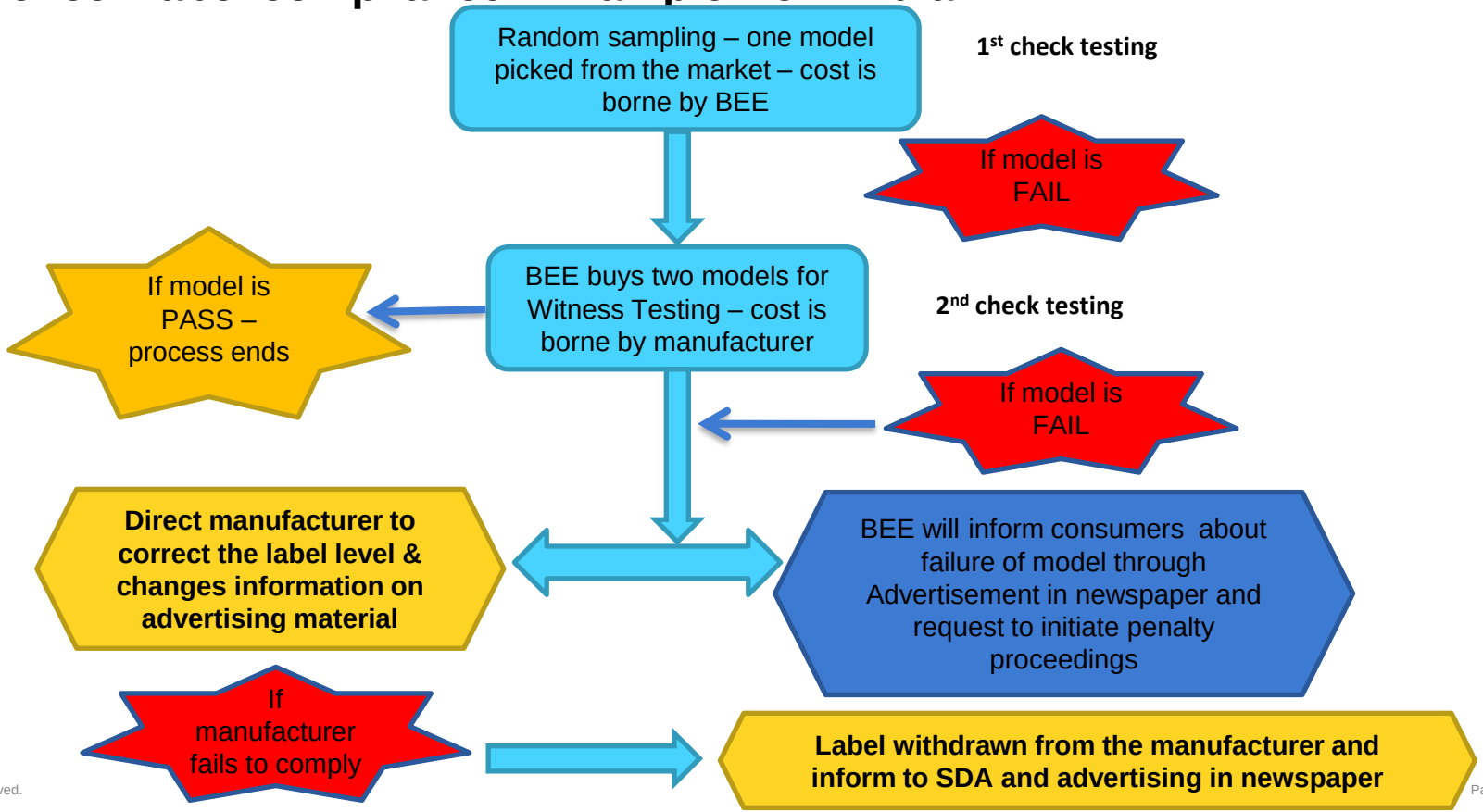
Market surveillance can be undertaken by:
-Government staff, Consumer groups, Contractors

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

Benefits

- 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



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:

1. Co-ordinate joint market surveillance with neighbouring economies
2. Share results of market surveillance to better target future actions
3. Use quality laboratories in neighbouring economies
4. Commission tests in product country of origin

Example – European surveillance coordination

- Various EU-wide (EU funded) projects
- Industrial and Tertiary Product Testing and Application of Standards (INTAS)

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

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

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

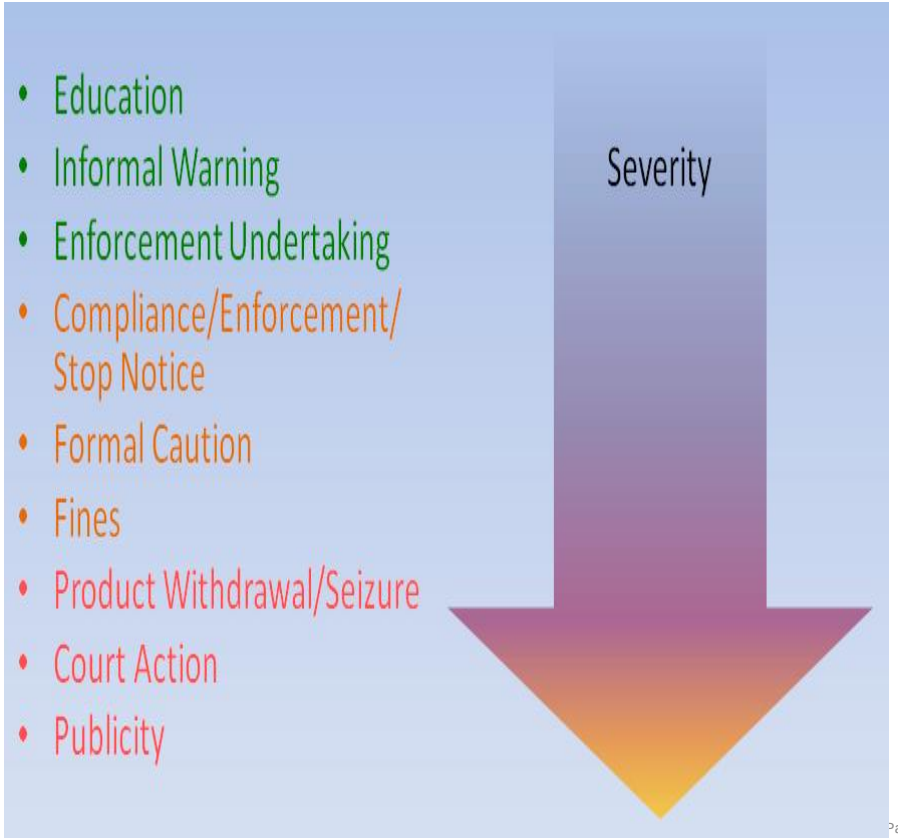
Example - UK response to non-compliance

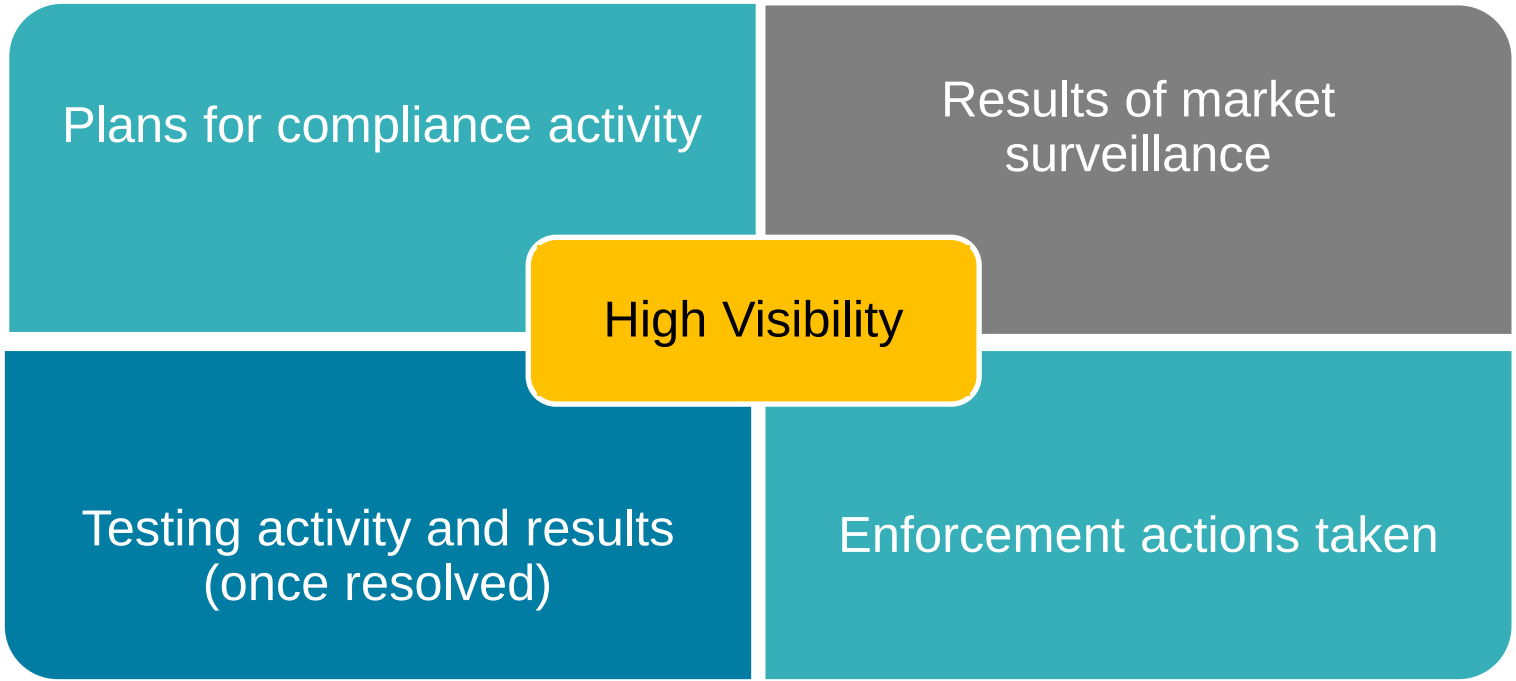
We operate in accordance with the Regulators' Code, which requires us to:

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

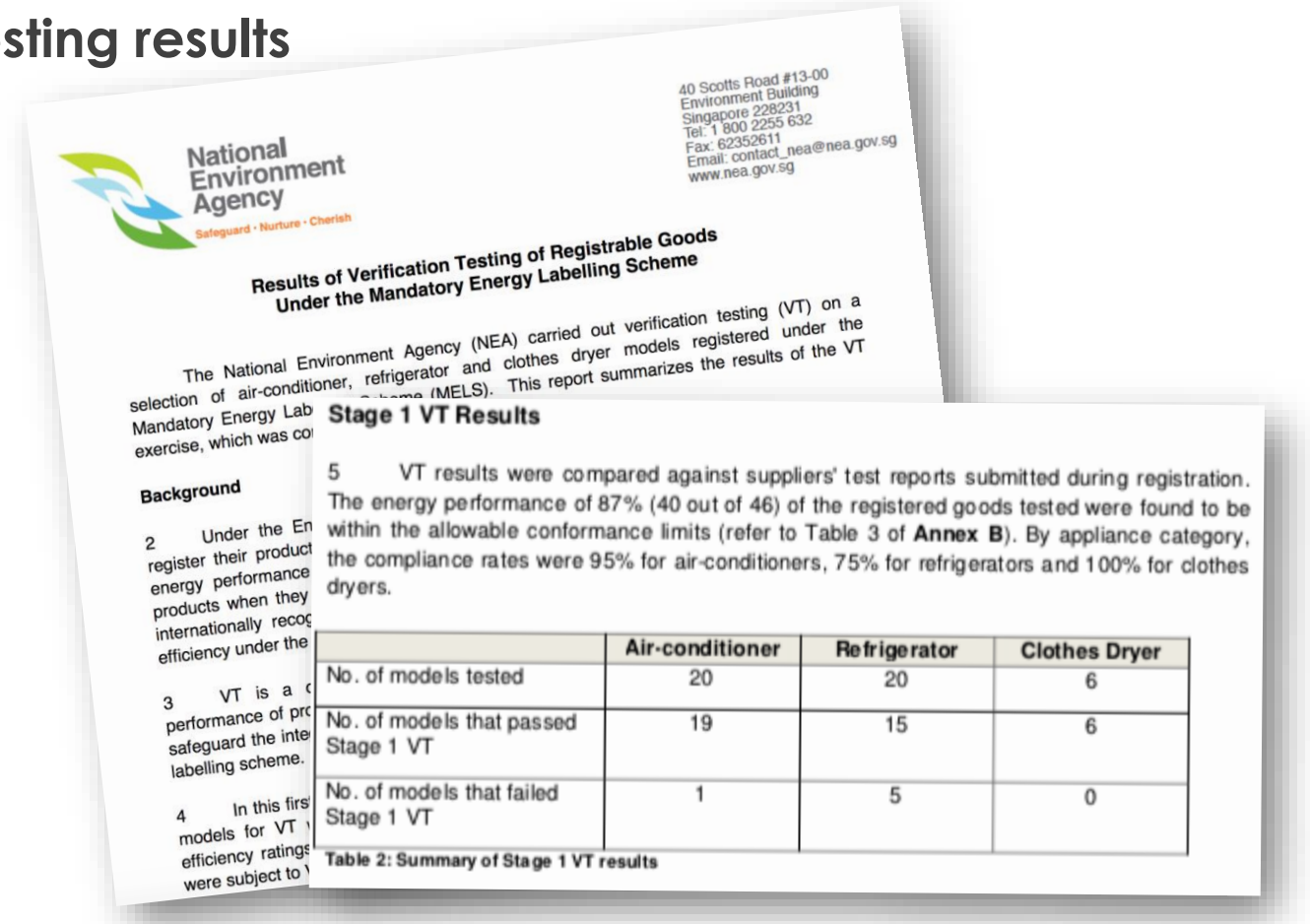
We always act proportionately, depending on the nature of the non-compliance.

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.





Reporting testing results



National Environment Agency
Safeguard · Nurture · Cherish

40 Scotts Road #13-00
Environment Building
Singapore 228231
Tel: 1 800 2255 632
Fax: 62352611
Email: contact_nea@nea.gov.sg
www.nea.gov.sg

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 models registered under the Mandatory Energy Lab... (MELS). This report summarizes the results of the VT exercise, which was co...

Background

2 Under the En... register their product... energy performance... products when they... internationally recog... efficiency under the...

3 VT is a ... performance of pro... safeguard the inte... labelling scheme.

4 In this firs... models for VT ... efficiency ratings... were subject to ...

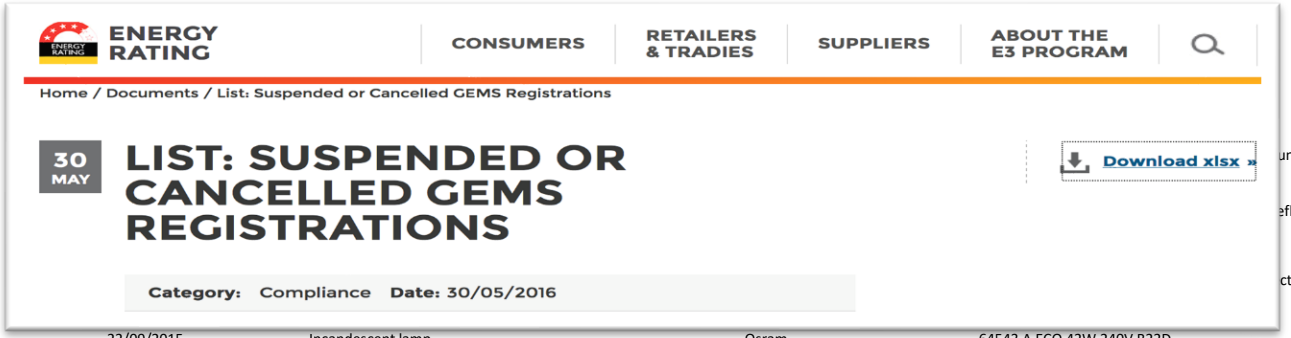
Stage 1 VT Results

5 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.

	Air-conditioner	Refrigerator	Clothes Dryer
No. of models tested	20	20	6
No. of models that passed Stage 1 VT	19	15	6
No. of models that failed Stage 1 VT	1	5	0

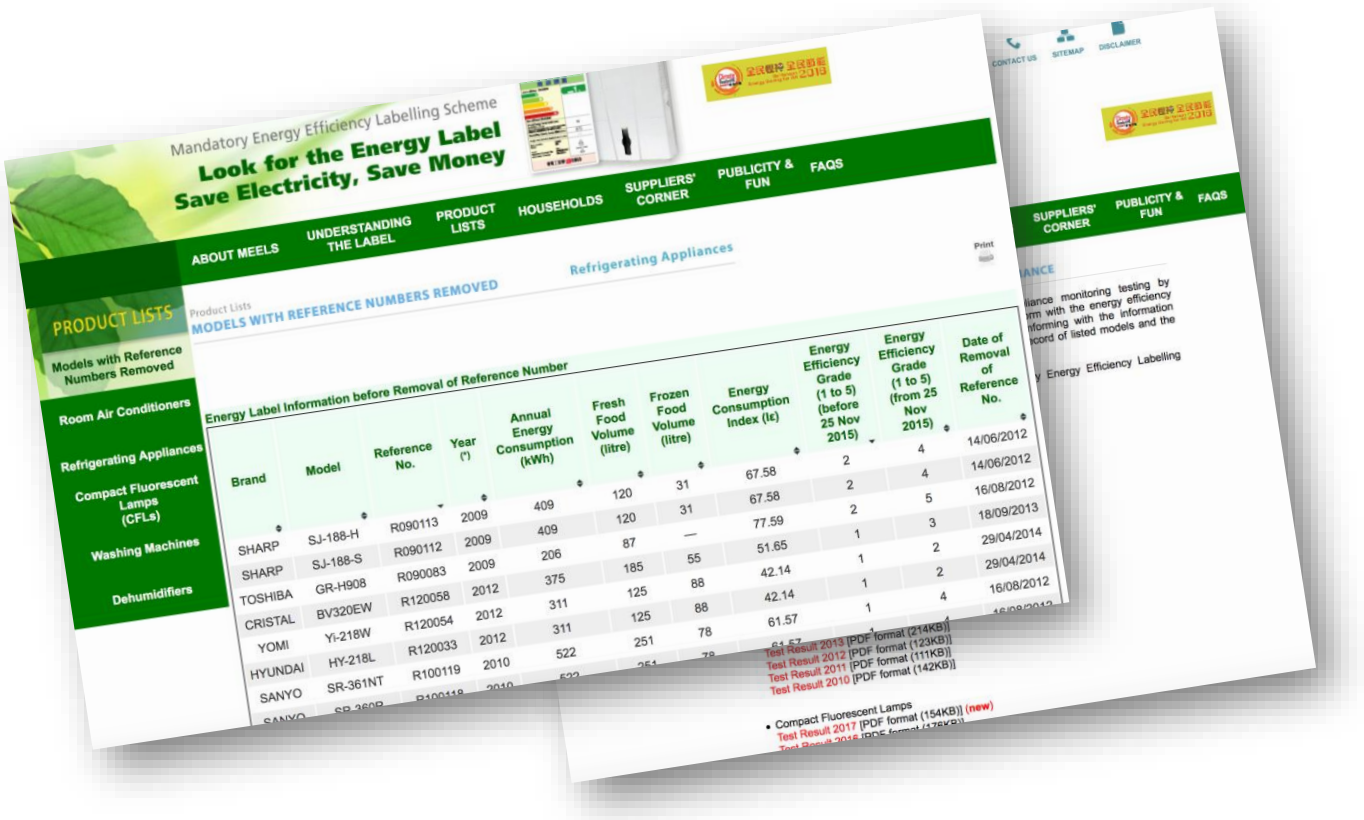
Table 2: Summary of Stage 1 VT results

Reporting enforcement actions



22/09/2015	Incandescent lamp	Osram	64543 A ECO 42W 240V B22D
22/09/2015	Incandescent lamp	Osram	64544 A FR ECO 53W E27
11/09/2015	Self-ballasted compact fluorescent lamp	Olsent	3P414-ES-40K,
17/08/2015	Self-ballasted compact fluorescent lamp	Envirolux	XEU48-15R80 E27 2700K
13/08/2015	Self-ballasted compact fluorescent lamp	Envirolux	XEU48-15R80 E27 4000K
30/07/2015	Self-ballasted compact fluorescent lamp	Olsent	FE-IISB-18W 2700K
30/07/2015	Self-ballasted compact fluorescent lamp	Olsent	FE-AU-15W 2700K
09/07/2015	Self-ballasted compact fluorescent lamp	E-Star	ESSP9W27E27 8w Mini Twist warm white 6500K
26/06/2015	Self-ballasted compact fluorescent lamp	Arlec	FT24
26/06/2015	Self-ballasted compact fluorescent lamp	Osram	Mini Twist 13W/827 E27
11/06/2015	Self-ballasted compact fluorescent lamp	Philips	Ambiance A55 11W WW
18/05/2015	Computer monitor	Philips	284E5Q
05/01/2015	Double-capped fluorescent lamp	NEC	FL30SSEX-N-HG-36 : 30W T8 Tri-Phosphor Natural 5000K

Example: Suspended products Hong Kong



Two types of testing models

	Post-market verification	Third-party certification
Entry conditions	Independent tests, in-house testing, calculation or self declaration	Third-party verification and/or certification
Government/Programme	$$	$
Industry participant	$	$$
consumers	$	$

Total costs ≈ same

Value of improving non-compliance

Assumptions	
Fridge market p.a.	200,000
Av. Energy consumption (kWh/year)	400
Non-compliance rate	15%
Extent of non-compliance	15%
Lifetime (years)	12
Cost of electricity ($/kWh)	0.2

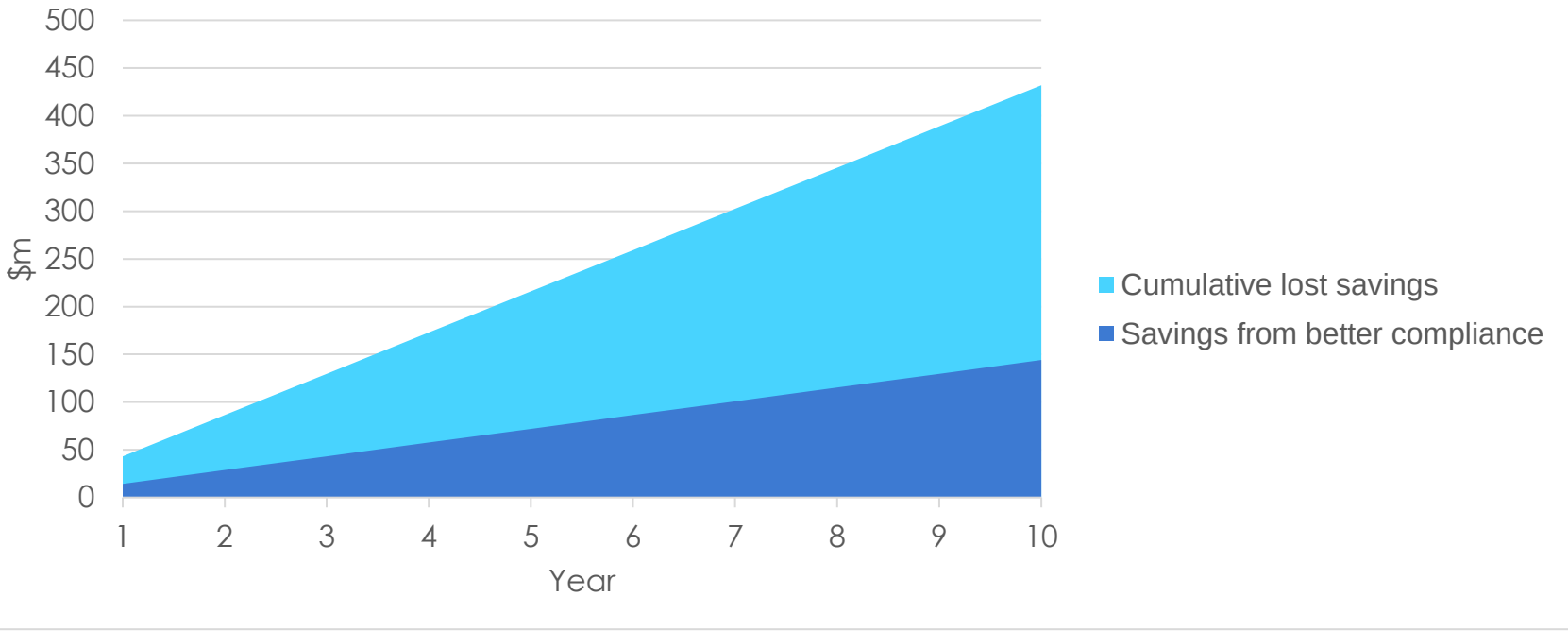
- Value of lost electricity - $ 4.32 million
- Cumulative after ten years $430 million

Outcomes

- Reducing non-compliance rate to **10%**
- Saving after one year - **$1.44 million**
- Cost-benefit ratio (if $300K MVE programme), in one year – **1:4.8**
- Cumulative savings after ten years - **$144 million**

The Value of Better Compliance

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



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

Self-study

Instructions

- Review the slides from today's session
- Complete the self-assessment quiz here: https://eu.surveymonkey.com/r/V566JXF

- Complete the self-study exercise: Understanding Labels (**Read the Word Document provided**)
- Please email your answers to: Energy.Efficiency@iea.org
  - Please label file: Last Name_First Name_04May
- If you have any questions don’t hesitate to reach out!