Technical Reference on Harmonization of Energy Efficiency Test Methods of Refrigerators Toward the New IEC 62552 among APEC Region
Held by China Standard Certification
Guiyang China, 2 December 2015

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ENERGY EFFICIENCY STANDARD AND LABELING FOR REFRIGERATOR IN INDONESIA

Outlines

- General Information
- Standard and Labeling In Indonesia
- BRESL Program on Refrigerator
- Standard test for refrigerator
  - What we do in Indonesia
- *Results of test*

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Introduction

Energy Saving Potential and Target

Sector	Energy consumption per sector in 2013 (Million BOE)	Energy Saving Potential	Sectoral Energy Saving Target (2025)
Industry	355 (42%)	10 – 30%	17%
Transportation	324 (39%)	15 – 35%	20%
Household	100 (12%)	15 – 30%	15%
Buildings / Commercial	36 (4%)	10 – 30%	15%
Others (Farms,Construction Sites, and Minings)	23 (3%)	25%	-

Sources:
Handbook of Energy & Economic Statistics of Indonesia 2014
(excluding biomass and non-energy use)

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Introduction

ESTIMATED REFRIGERATOR SOLD IN INDONESIA

- Based on official data at the Ministry of Industry, the country's production of household electrical appliances has increased in the 2007-2012 period.
- The production of refrigerators totaled 2,194,000 units in 2007, up to 2,240,000 units in 2011 and to an estimated 2,350,000 units in 2012.
- Need action to Promote energy efficient home appliance products in Indonesia
- Incentive from Government is critical action to get saving from house hold especially refrigerator

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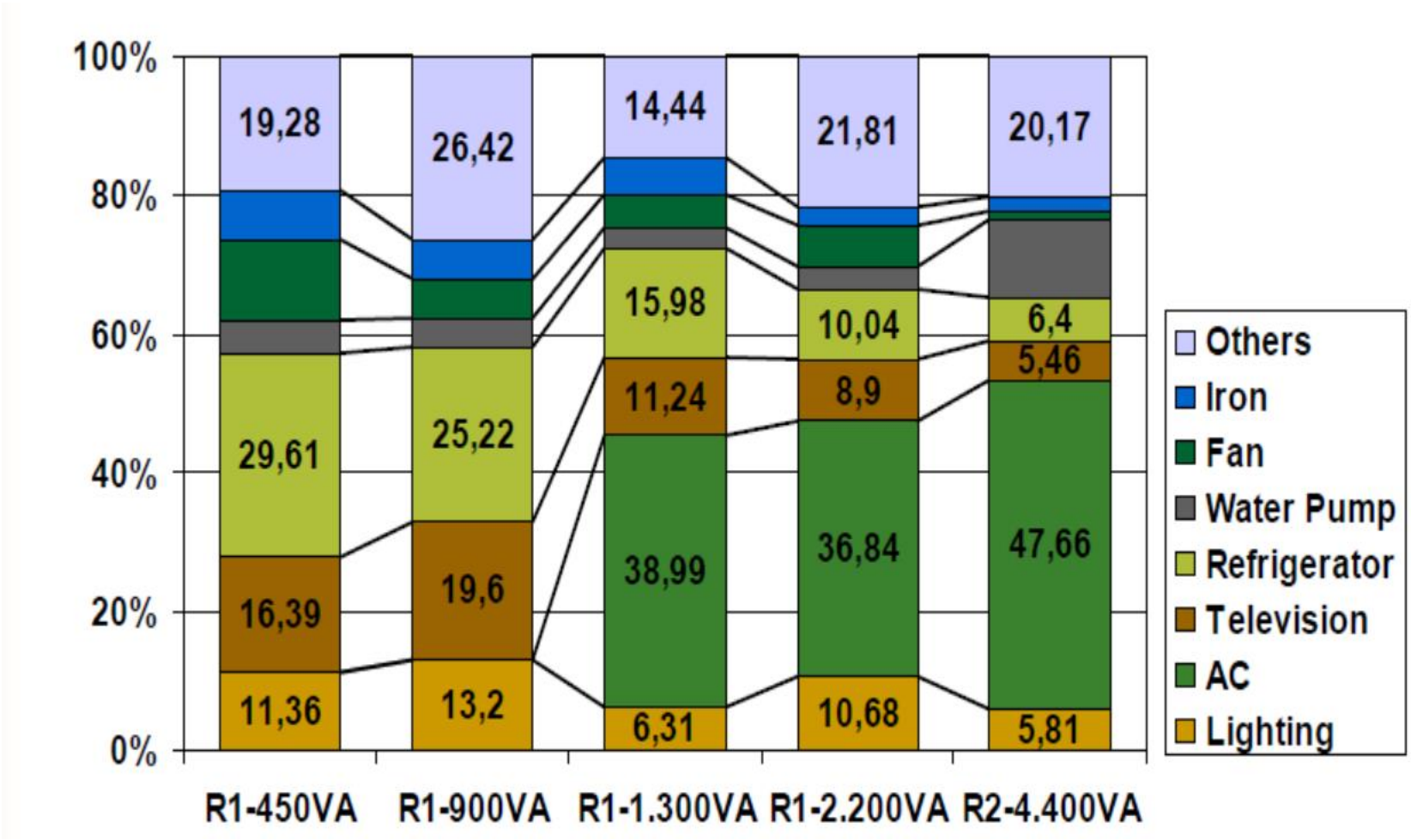
Introduction

Typical Electric Power Consumption in Residential Users



Source: JICA STUDY (2008)

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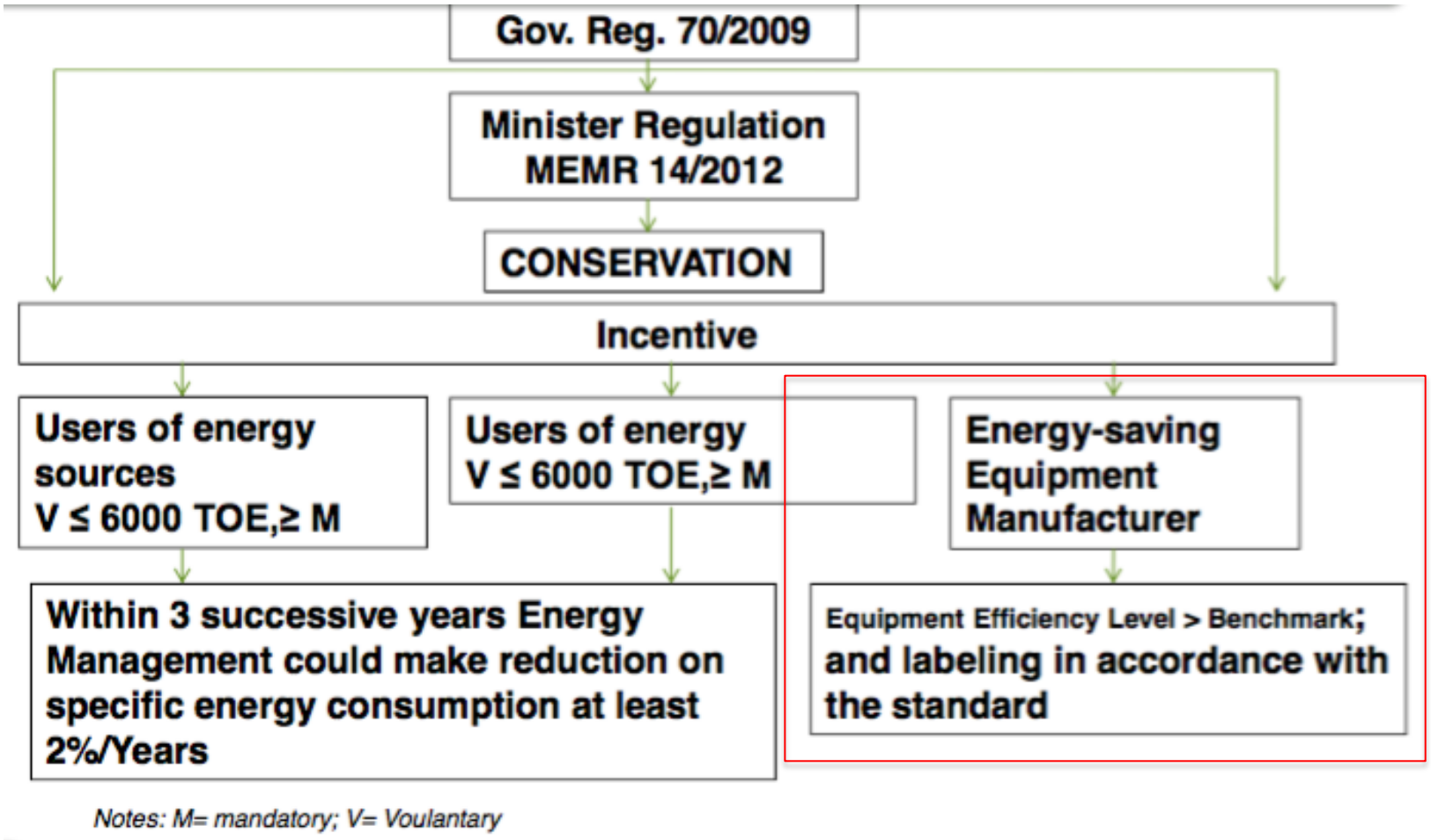
Introduction

Incentive from Goverment



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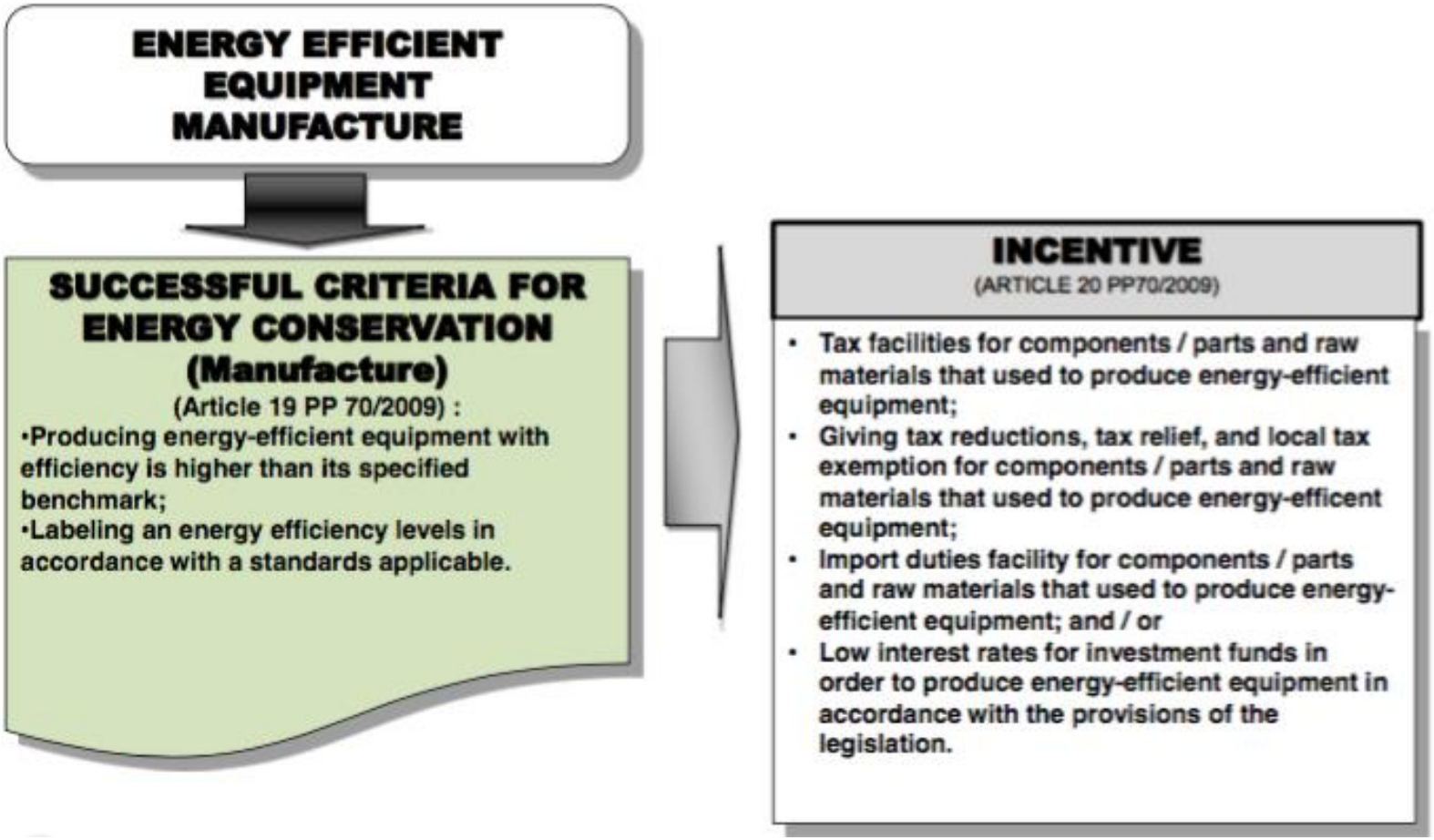
Introduction



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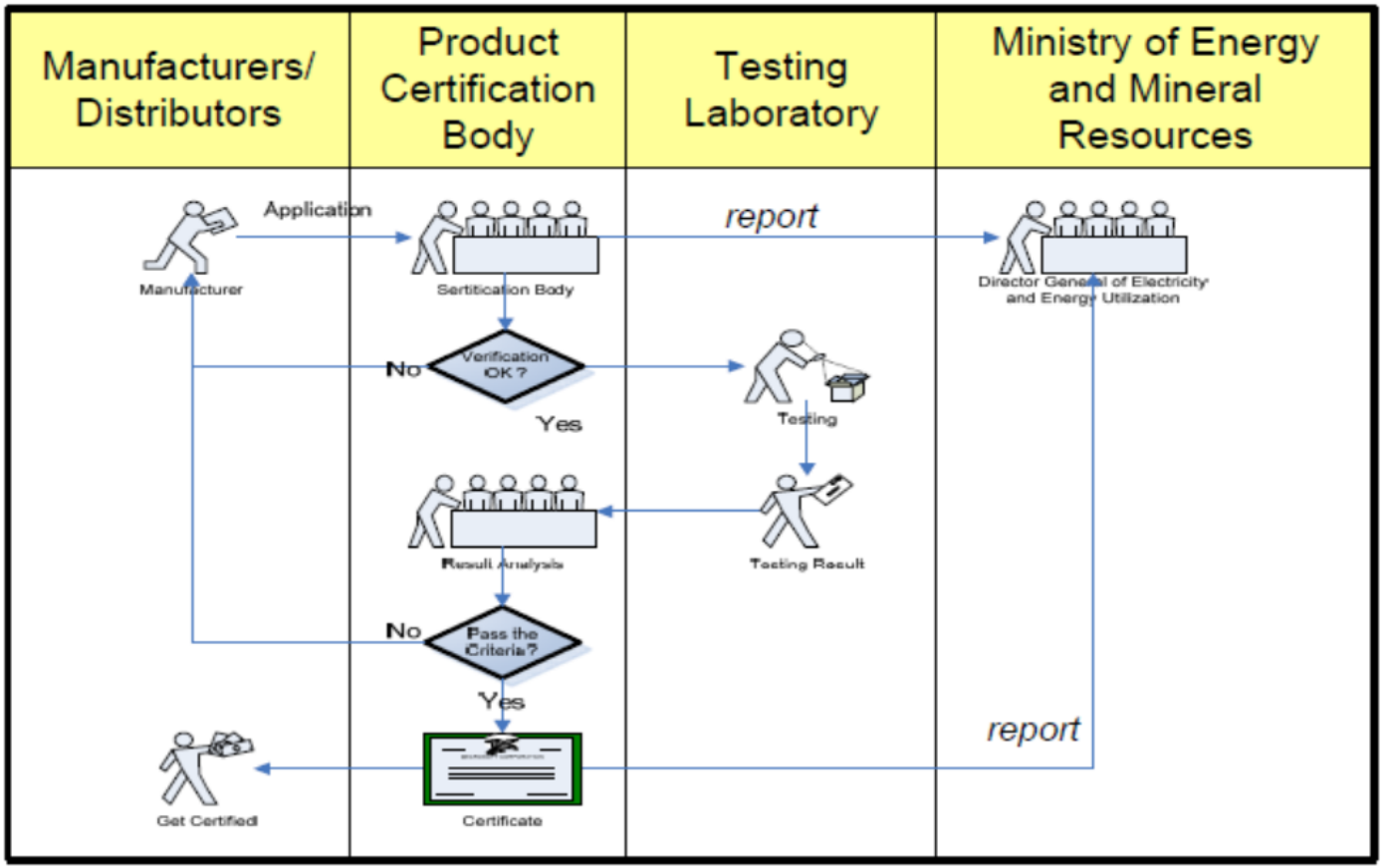
Standard And Labeling In Indonesia

FLOW DIAGRAM OF ENERGY EFFICIENCY LABELING



Product Certification Body : PT TUV Nord Indonesia, PT EMI, PT Sucofindo
Testing Laboratory : P3TKEBT-DESDM, B2TE-BPPT, PT Sucofindo

Source: Mustofa, Ministry of Energy and Mineral Resources, 2014

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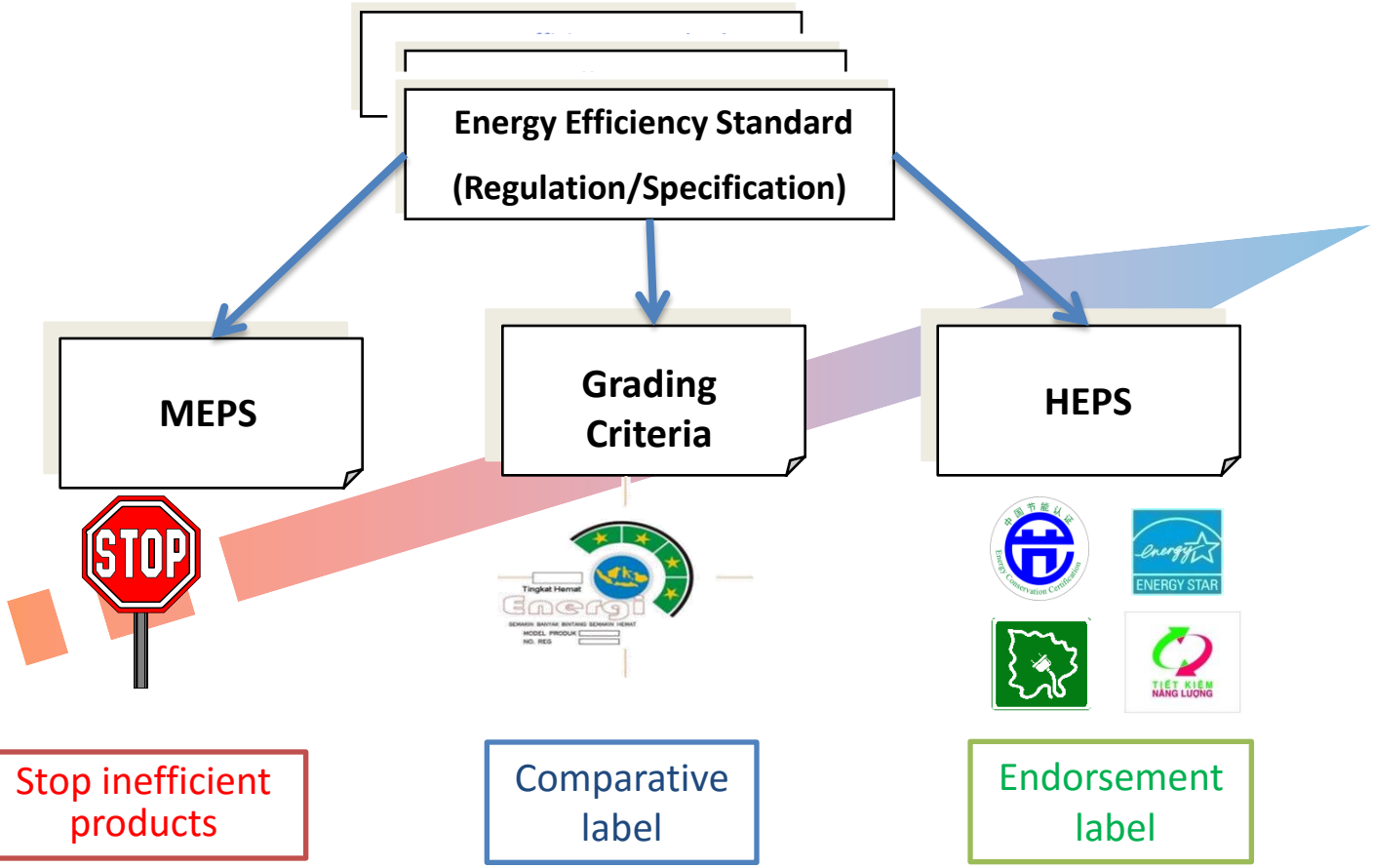
Standard And Labeling In Indonesia

Framework for EE Standardization and labeling



Source: BRESL PROJECT (2014)

HEPS: High Energy Performance Standard

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Standard And Labeling In Indonesia

Minimum energy performance standards (MEPS) and Comparative Label

- Developed countries have introduced MEPS and labelling: Lamps, Room air conditioner, **Refrigerators**, TV, Washing machines and Dryers, and Water heaters.

- In developing countries, labelling less common and seldom mandatory.

- Energy efficiency standards and Label programmes have been effective and complementary measures to transform the market.

- To remain effective, they must be regularly revised and updated to stimulate technical progress

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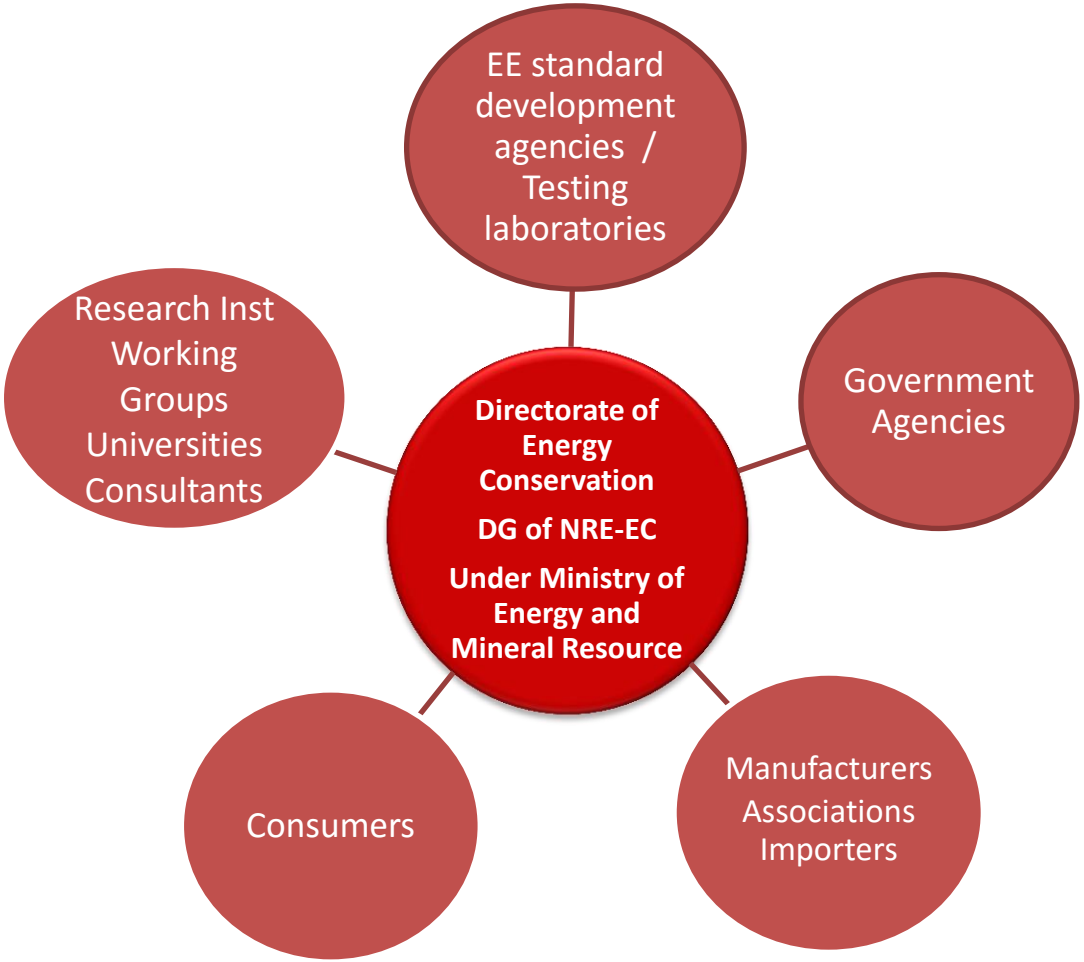
Standard And Labeling In Indonesia

Key Stakeholders of EESL



Source: BRESL PROJECT (2014)

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BRESL In Indonesia

BARRIER REMOVAL TO THE COST-EFFECTIVE DEVELOPMENT AND IMPLEMENTATION OF ENERGY EFFICIENCY STANDARDS AND LABELING PROJECT

OBJECTIVE:
Promote energy efficient home appliance products in Indonesia.

OUT COMES

- Enhanced awareness on ES&L in the use of EE products .
- Facilitation of development and implementation of ES&L
- Regional network to facilitate Coop, Harmonize, ad Mutual Recognize
- Successful demonstration of institutionalization or incentive policies

Source: BRESL PROJECT (2014)

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BRESL In Indonesia

Target Product For Labeling

1. Compact Fluorescent Lamp
2. **Refrigerator**
3. Room Air Conditioner
4. Rice Cokers
5. Electric Fans
6. Electronic Ballast
7. Electric Motors

Source: BRESL PROJECT (2014)

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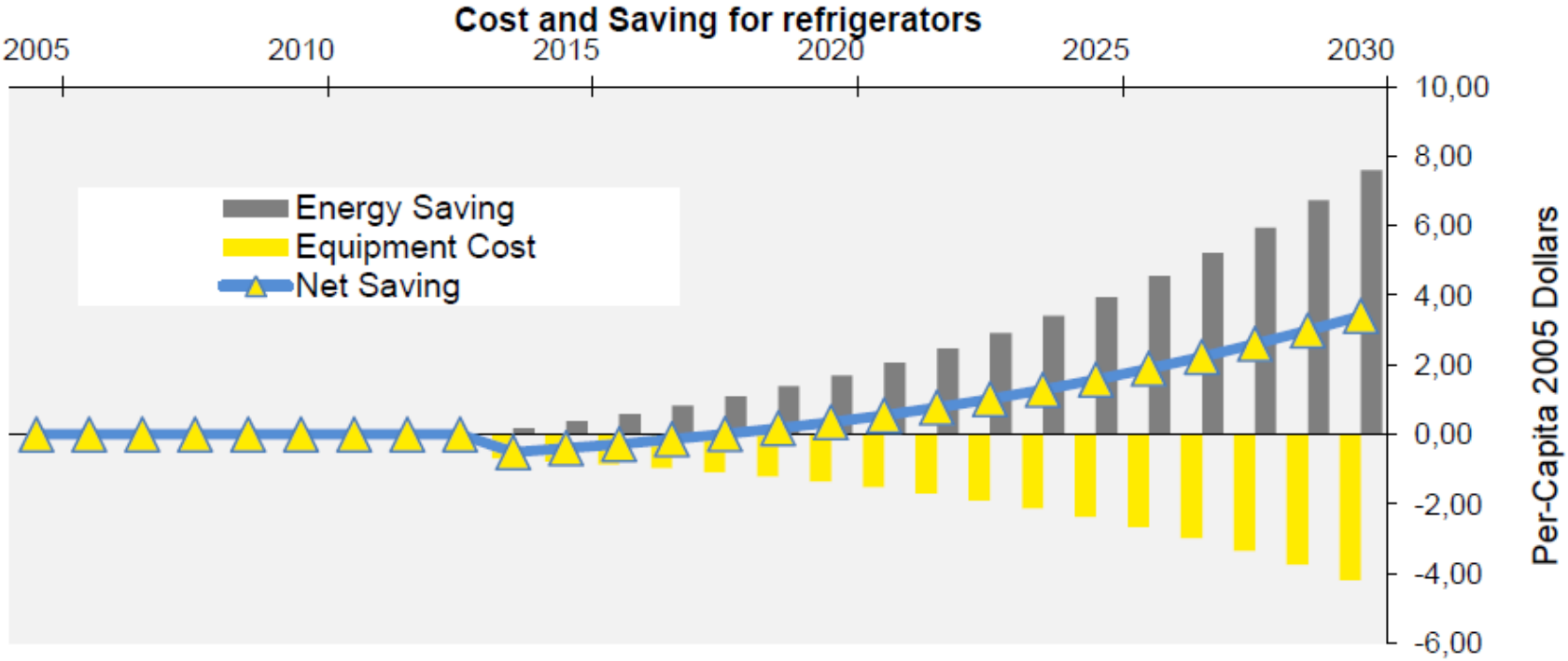
BRESL In Indonesia

COST AND ENERGY SAVING AFTER IMPLEMENTATION OF EE-S&L PROGRAM INDONESIA



The results of this analysis allow for evaluation of overall impacts of the various options of MEPS for Indonesian Refrigerators. As seen above, there is a marginal dip in net savings during the initial year which is due to the incremental cost associated with this appliance. And during later years, the per capita energy savings increases at a rapid rate than the per capita equipment cost. The overall impact of refrigerators with MEPS would yield consumers an NPV of 1303.2 Million US$ over the next 20 years and it would also save 182.60 MT of CO_2 emissions during the same period.

Source: BRESL PROJECT (2014)

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Ministry Regulation on MEPS for Refrigerator

Based on *ISO 5151:2010* dan *IEC 60335-2-40-2010*

Scope of Standard :

- Standard for testing refrigerators is proposed for household use, with one or more compartments with the capacity of gross volume up to 300 L.

Type of Refrigerators

1. Climate Class T with a range of ambient temperatures (+ 16 ° C to + 43 ° C) according to ISO 15502: 2008
2. Has a frozen food storage compartment with a capacity freezing or without freezing capacity

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Standard And Labeling In Indonesia

Energy Efficiency Label : SNI 04-6958-2003 (Comparative Label)

- Labeling program will be implemented on home appliances
- Regulated by Ministry Energy and Mineral Resources
- Information on Energy Consumption
- To identify energy saving level for electrical household appliances and all kinds
- The Standard includes:
  - Form, size, color and symbol significance of the energy saving level label
  - Location for the energy saving level label
  - Criteria of energy saving level
  - Energy saving level score and amount of star

Reference :

- Australia Standard AS 2575.1-1989
- New Zealand Standard NZS 6205.1-1989

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Standard And Labeling In Indonesia

Energy Efficiency Standard For Refrigerator

[kWh / year]

Star Rating	Freezing and without freezing	
	Without freezing capacity	With freezing Capacity
1 star (☆)	< 465 + 1.378 x V_{adj} x 1.15	< 465 + 1.378 x V_{adj} x 1.55
2 stars (☆☆)	≤ 1 star x 0.77	≤ 1 star x 0.77
3 stars (☆☆☆)	≤ 2 stars x 0.77	≤ 2 stars x 0.77
4 stars (☆☆☆☆)	≤ 3 stars x 0.77	≤ 3 stars x 0.77

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Standard Test for Refrigerator

Testing condition :

1. Temperature of cooling space test
2. Freezing space test
3. Energy consumption test
4. Increasing of temperature test
5. Density of air test

Standard Test for Refrigerator

Information on Reporting :

- Pressured part
- Electrical part
- Heat part
- Total volume
- Defrosting
- Seal condition
- Mechanical strength
- Door strength
- Reliability
- Noise and vibration
- Heat insolation
- Temperature of cooling space
- Power characteristic with no load
- Average power consumption
- Capacity of ice production
- Descriptive information about placement of food and froozen food

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Standard Test for Refrigerator

Methods of electrical energy consumption testing of refrigerators refer to:

- SNI 04-6710 - 2002: Cooling equipment for households - Refrigerators with or without low temperature compartments - the characteristics and testing methods.
- SNI 04-6711 - 2002: freezers Refrigerating Equipment - characteristics and testing methods
- SNI 05-3088 - 1992: Test method for household refrigerators for information to consumers.

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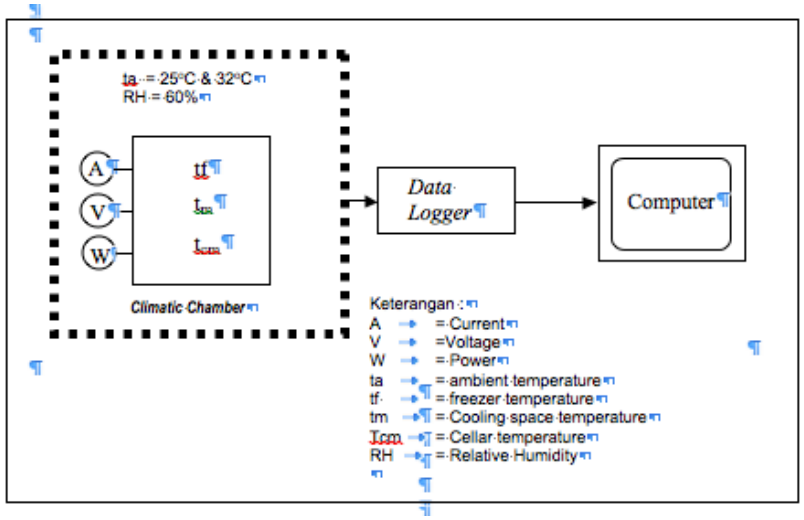
Example of Refrigerator Test



Example of unit tester:

- Model / Type : VR-D170s
- Voltage : 220 Volt
- Freq : 50 Hz
- Power : 74 Watt
- Current : 0.6
- Dim : 570 x 1261 x 585 mm
- Gross Volume : 182 Liter
- Weight : 42 kg
- Sample : 4 Unit
  - LP-01 serial number Q 120240501217 (tested)
  - LP-02 serial number Q 120240501215 (tested)
  - LP-03 serial number Q 120240501211 (tested)
  - LP-04 serial number Q 120240501213 (sample back-up)

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Example of Refrigerator Test

- **Freezer temperature (t_f) :**
  - Ambient temperature 32°C -> -10.3°C
  - Ambient temperature 25°C -> -10,8°C (4 % lower)
- **Cooling space temperature *(t_m)***
  - Ambient temperature 32°C -> average +2.3°C
  - Ambient temperature 25°C -> average -0,2°C
- **Cellar temperature *(t_m)***
  - Ambient temperature 32°C -> average +6.9°C
  - Ambient temperature 25°C -> average +3.8°C

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Example of Refrigerator Test

- **Power Usage**
  - Ambient temperature 32°C -> 69.09 W
  - Ambient temperature 25°C -> 71.42 W
- **Daily Energy Consumption**
  - Ambient temperature 32°C -> 1.17 kWh (27.8 % higher)
  - Ambient temperature 25°C -> 0.86 kWh

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谢谢
THANK YOU

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