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FRAMEWORK
of
ENERGY EFFICIENCY LABELING PROGRAM
PART 1: GENERAL PROVISION
(DRAFT) Rev. 3rd

November, 2011

Prepared by;
Technical Meeting for EE Labeling Program in Indonesia

Introduction

Energy efficiency labeling program has been under preparation by Indonesian government. This document named “Framework” has been being made in order to summarize up opinion and idea of stakeholders who are concerning on the energy efficiency labeling program. The framework is the basic structure of the regulation for the voluntary labeling program showing how to apply and maintain energy efficiency label on the home appliances to the manufacturers, importers, retailers, consumers and the government. Therefore, the documents shall be used as the recommendation to the government on making nation-wide regulation for the operation and maintenance of the program.

“Technical Meeting for EE Labeling Program in Indonesia” was organized as a stakeholders meeting in order to discuss the issues above mentioned and accomplish the Framework.

Technical Meeting for EE Labeling Program in Indonesia

Member;

Ministry of Energy and Mineral Resources (MEMR)

Ministry of Industry (MOI)

Ministry of Trade (MOT)

National Accreditation Body (KAN)

Agency for the Assessment and Application of Technology (BPPT)

Indonesian Institute of Sciences (LIPI)

Laboratory for Quality Testing of Export and Import Goods (BPMBEI)

Dir. ITE – IUBTT

The Indonesia Electronic and Electrical Appliance Industries Association (GABEL)

PT. Berkat Andijaya Elektrindo

PT. Hitachi Modern Sales Indonesia

PT. LG Electronics Indonesia

PT. Maspion Group

PT. Panasonic Manufacturing Indonesia

PT. Panggung Electric Citabuana

PT. Polytron

PT. Samsung Electronics Indonesia

PT. Sanken Argadwija

PT. SANYO Indonesia

PT. Sarana Aircon Utama

PT. Sharp Electronics Indonesia

PT. Sony Indonesia

PT. Star Cosmos

PT. Sucofindo

PT. Toshiba Consumer products Indonesia

PT. Topjaya Antariksa Electronics

BRESL National Project Unit

JICA DSM Study Team

1. Purpose

The purpose of the energy labeling is to make the buyers aware of the energy efficiency level of the product so that he/she will be able to compare energy efficiency of different brands of the specified product and make accurate purchase decisions to select more energy efficient products without just take into consideration the capital cost of the product. Furthermore labeling encourages the manufacturers and importers of the products to tend towards manufacturing and trading higher energy efficiency products in the market.

2. Operation of the labeling Program

The labeling program shall be conducted by the government cooperated with the stakeholders including manufacturers and importers, laboratories, retailers and consumers. The labeling program should not be mandatory program, but voluntary program.

Note.

Mandatory program; Manufacturers and importers cannot sale products which have no energy efficiency label on the market. The labeling should be applied under relevant regulation issued by the government. Violation to the regulation must be punished.

Voluntary program; Manufacturers and importers can sale products which have no energy efficiency label on the market. When the manufacturers and importers intend to put the label on their products to sale, they have to follow the relevant regulation. Violation to the regulation must be punished as well.

3. Definitions

3.1 Label

“Label” is the energy efficiency label with maximum 4 stars rating. The design has been issued as SNI 04-6958-2003.

3.2 Products

“Products” are the designated home appliances to be applied label.

Specific definition of the product will be made in PART 2, 3 and 4 of the series document.

3.3 Manufacturers and Importers

“Manufacturers and importers” are the individuals or the organizations who manufacture, assemble the product locally or import the products from foreign countries, and supply the product to Indonesian market.

3.4 Consumers

“Consumers” are the individuals or the organizations who buy the products in the domestic market and use them for their own purpose.

3.5 Retailers

“Retailers” are the individuals or the organizations who sale the products in the domestic market to the consumers.

3.6 Label certification body

“Label certification body” is the administrative body who is an agent of the government and issue the label certificate to the manufacturers and importers. Label certification body shall be accredited by KAN/BSN and assigned by the government.

3.7 Accredited laboratory

“Accredited laboratory” is the laboratory which is accredited by KAN/BSN and assigned by the government to carry out tests for energy efficiency measurements of the products.

3.8 Equivalent laboratory

“Equivalent laboratory” is the laboratory which is not accredited by KAN/BSN, but recognized that it must have enough competency of conducting energy efficiency measurements tests. Criteria for evaluation will be specified respectively in PART 2, 3, 4 of the series document.

3rd party laboratories and manufacturer’s in-house laboratories which are located in foreign countries and accredited by foreign authorities can be the candidate of “Equivalent laboratory”

3.9 Energy efficiency and Energy efficiency indicator

“Energy efficiency indicator” is the specified unit of the energy efficiency. “Energy efficiency” is the actual value of energy efficiency of the product. Actual energy efficiency indicators for the products will be specified respectively in PART 2, 3, 4 of the series document.

3.10 Designated (EE) measurement method

“Designated (EE) measurement method” is the unified testing and calculation method and condition for energy efficiency measurement of the products especially designated for the labeling program. The designated measurement method is often given by the existing industrial standards such as ISO/IEC, INS and JIS.

3.11 Star rating

“Star rating” is the common term used to express energy efficiency rating in the label given to the product based on the actual value of the energy efficiency. Star rating is indicated in the label as the number of star. Minimum star rating is 1 star, and maximum 4 stars.

3.12 Star rating criteria

“Star rating criteria” is the criteria which definite scopes of 1 star to 4 star label. Star rating criteria should be given by the level of the energy efficiency of the products. Actual star rating criteria will be shown in PART 2, 3 and 4 of the series documents.

3.13 Test and test report

“Test” is the test for energy efficiency measurement of the products conducted under the designated measurement method. “Test report” is the documentation of result of the test issued by the accredited laboratories or the equivalent laboratories.

3.14 Label certificate

“Label certificate” is the certificate issued by the label certification body to the manufacturers and importers which certify the energy efficiency, number of stars in the label, validity period, issue date and expiration date.

3.15 Technical committee

“Technical committee” is the committee formulated and commissioned by the government in order to review the labeling program and give recommendation for the improvement of the program to the government.

4. Roles

4.1 Manufacturers and importers

Application for the label certificate

- The manufacturers and importers shall submit application form for label certification to the label certification body attached with the necessary document.
- When manufacturers and importers want to use their in-house laboratory test data for the labeling, they have to submit the data to the label certification body. In that case, the laboratories shall be “Accredited laboratory” or “Equivalent laboratory”. The manufacturers and importers shall submit the relevant document which proofs it.
- The manufacturers and importers which want to leave test to the accredited laboratory shall submit samples to the accredited test laboratory together with the application. A copy of the application shall be forwarded to the label certification body. The manufacturers and importers shall bind to bear the test fee including transportation of the samples.

Affix of label

- On receiving the label certificate from the label certification body, the manufacturers and importers shall affix the label as per the given format and the dimensions stipulated in SNI 04-6958-2003 on the product or the package of the product.
- The manufacturers and importers can also mention about the label on catalogs or other information of the products.
- The manufacturers and importers shall renew the label certificate on the termination of its validity period which is mentioned on the product or the package of the product.
- Apart from the label, the manufacturers and importers shall display/mark necessary information of the product on the product and/or the package as mentioned in PART 2, 3 and 4 of the series document. (Mandatory display)

Other

- The manufacturers and importers shall not mislead the consumers by affixing similar label which is not certified by the label certification body or displaying incorrect information of the product.
- The manufacturers and importers shall make efforts to produce or import higher energy efficiency products.
- The manufacturers and importers shall make efforts to indicate the energy efficiency value of the product on catalogs, web pages, and other media.
- The manufacturers and importers are expected to disclose sales/production data of the labeled products to the government or label certification body.

4.2 Retailer

Instruction to the consumers

- The retailers are expected to deeply understand of the labeling program and accurately instruct it to the consumers.
- The retailer shall not mislead the consumers by providing inaccurate information of the energy performance of the product.

Other

- The retailer shall make efforts to sale higher energy efficiency products with the label.
- The retailers are expected to disclose sales data of the labeled products to the government or label certification body.

4.3 Label certification body

Accreditation

- The candidates of label certification body shall apply of label certification body to KAN/BSN, and shall be finally accredited.

Certification

- The label certification body shall issue certificate to the manufacturers and importers after enough evaluation of manufacturer's relevant document and accurate assessment of star rating basing on the test data and conforming to the specified star rating criteria.
- The label certification body shall issue certificate to the manufacturers and importers by 2 weeks after receiving application from them or test report from accredited laboratory.
- When the label certification body cannot issue certification, it shall inform the reason to the manufacturers and importers by 2 weeks after receiving application from them or receiving test report from accredited laboratory, and/or asking them for additional documents needed for the issue.

Monitoring and inspection

- The label certification body shall monitor the labeling program on the product in the market. When it finds any illegal labeling, it shall report the fact to the government.
- The label certification body shall submit annual report of the labeling program which mention about the manufacturer's application of label and issue of the label certification.

4.4 Accredited laboratory, Equivalent laboratory

Accreditation

- The candidates of accredited laboratory shall apply of accreditation to KAN/BSN, and shall be finally accredited.

EE measurement

- The accredited laboratory and the equivalent laboratory shall conduct tests accurately as per the designated measurement method and submit test report to the label certification body and/or the manufacturers and importers.
- The accredited laboratory and the equivalent laboratory shall maintain and calibrate the test facility and instruments required to conduct tests as per the designated measurement method. Also the test staffs shall maintain test skill in order to conduct accurate tests.
- The accredited laboratory shall conduct inspection tests as per the designated measurement method in case that the label certification body or government request.
- The accredited laboratory shall get agreement of price and duration of test with the manufacturers and importers, certification body or government, before conducting test.

Witness to the tests at manufacturer's in-house laboratory

- As the manufacturer's requests, the accredited laboratory shall dispatch qualified test staffs to manufacturer's laboratory for the witness of the tests. The witness can be recognized as the substitution of accreditation on the manufacturer's laboratory. The staffs shall submit witness report to the manufacturer's laboratory.

4.5 Government

Legislation

- The government shall issue and enforce the regulation on the labeling program. The regulation shall include the following items.

Content of the regulation

Item	Remarks
Procedure	Application, test, label certification, inspection, maintenance, data verification
Accreditation	Accreditation of laboratory and certification body
EE indicator	Definition of the EE indicator
Measurement method	Designation of the measurement method (Citation of existing standards)
Star rating criteria	Definition of the criteria If necessary, setting of MEPS (Minimum Energy Performance Standard)

Item	Remarks
Mandatory display	Display of EE data and other information
Penalty	Penalty to illegal labeling and false display or announcement
Review of the labeling program	Periodical review of the program
Fee	Application, test

Accreditation and Commission of Label Certification Body

- The government shall commission the accreditation of label certification bodies to KAN/BSN.
- The government shall commission of the label certification to the label certification bodies after their accreditation.

Formulation of the Technical committee

- The government shall formulate the Technical committee inviting members from stakeholders, and commission advisory for improvement of the labeling program.
- The government shall prepare annual report of labeling program for the discussion in the committee.
- The government shall record of the discussion in the committee.

Administration and penalty

- The government shall announce of the labeling program to the manufacturers and importers, retailers and also the consumers and make them to join to the program.
- The government shall give administrative recommendation, direction and order to the manufacturers and importers or retailers if necessary.
- The government shall put penalty to the manufacturers and importers or retailers on their contravention activities.

Monitoring and review

- The government shall conduct market survey in order to discover the market penetration of those products with high energy efficiency. The information thus collected shall be used for the review of the energy labeling program.
- The government shall review the labeling program including regulation periodically, and improve the program by revising the regulation.

4.6 Technical committee

Formation

- The members of committee shall consist of manufacturers and importers, accredited laboratory, label certification body, consumer, association government and other stakeholders.

- The chairman of the committee shall be selected among the members.

Recommendation to the government

- Technical committee shall review the labeling program and report to the government as the recommendation.

4.7 KAN/ BSN (National Standardization Agency of Indonesia)

Accreditation of Label Certification Body

- KAN/BSN shall accredit label certification body within 3 weeks after receiving application.
- KAN/BSN shall disclose evaluation criteria for the accreditation.

Accreditation of Accredited Laboratory

- KAN/BSN shall accredit accredited laboratory 3 weeks after receiving application.
- KAN/BSN shall disclose evaluation criteria for the accreditation.

Standardization

- BSN shall issue the standard of EE measurement method which is requested by the government or industrial parties for convenient implement of the labeling program.
- The standards for EE measurement method shall be made considering of the test ability of the laboratories which are expected to be in charge of the labeling program.
- The standards for EE measurement method shall be made considering of the current international or regional movement on the standardization/harmonization.

5. Incentive and Disincentive

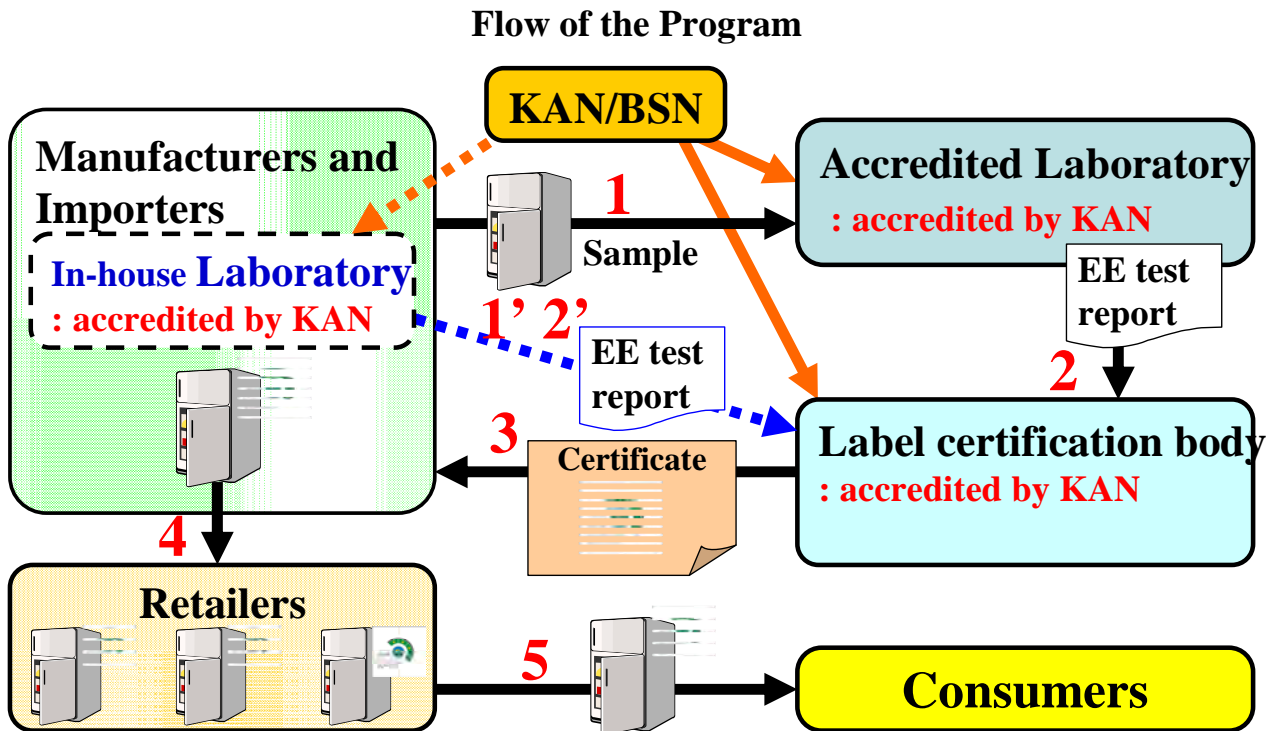
5.1 Incentive

- The government shall provide incentive programs for the highly labeled product and the manufacturers and importers who deal with such products.
- Following incentive shall be provided.
 - Official announcement of highly labeled product to the consumers
 - Putting priority on highly labeled product to be adopted in official purchase

5.2 Disincentive

- The government shall provide penalty on the manufacturers and importers who deal the products attached with false labels or give wrong information to the consumers
- Following administrative action shall be provided
 - Administrative recommendation and order to the manufacturers and importers mentioned above

- Disclosure of the name of the manufacturers and importers mentioned above
- Monetary punishment on the manufacturers and importers mentioned above



Note; in case that manufacturer's in-house laboratory is not accredited, tests under the witness of the accredited laboratory can substitute the accreditation.

FRAMEWORK
of
ENERGY EFFICIENCY LABELING PROGRAM
PART 2: TECHNICAL PROVISION
for
REFRIGERATOR
(DRAFT) Rev. 3rd

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Prepared by;
Technical Meeting for EE Labeling Program in Indonesia

1. Type and Scope of Products

Refrigerator referred is the refrigerator that has obtained a Certificate of safety from Indonesian National Standard (SNI) in accordance with SNI number 04-6710-2002 or its revision, with a class T tropical climate corresponding with ISO 04-15502-2008, and has a frozen food storage compartment with/ without freezing capacity.

The scope of this performance test include:

- 1) determination of linear dimensions, volume, and extent
- 2) energy consumption with load.

2. Category

Measurement methods and criteria to determine EE labeling star rating should be based on the following criteria:

Table 2-1 Refrigerator labeling Category

	Measurement method
Category	1. With freezing capacity 2. Without freezing capacity

3. Energy Efficiency Indicator

Indicator of energy efficiency is the “energy consumption in each year per adjusted inner volume”. (kWh / year / liter)

4. Energy Efficiency Measurement Method

Energy Consumption

Procedures and requirements for energy consumption performance test is applicable to the refrigerator with a tropical climate (T) class according to Standard SNI 04-6710-2002 and SNI 04-6711-2001. Refrigerator’s level of energy efficiency is determined based on the value of energy consumption per year (kWh / year) obtained through testing procedures (point 5.2). The energy consumption per year is calculated by multiplying the 24 hours kWh by 365 days.

For test and procedures for refrigerator’s energy consumption, refer to Appendix 1.

Adjusted inner volume

Adjusted inner volume is an inner volume inside the refrigerator. Measurement method of the inner volume inside must be in line with ISO 04-6711 (2002) and in accordance with clause 5.

5. Criteria of Energy Efficiency Rating

Criteria of energy efficiency rating is based on electric power output that is utilized by consumers compared to the consumed electric power input, or the use of electric power for a certain period.

Refrigerator's Energy Efficiency Rating Criteria is determined based on the value of energy consumption per year (kWh / year)

Determining energy efficiency stars is distinguished between refrigerator with and without a freezer, using the following formula:

5.2.1. Without a freezer

Star rate	Formula
1 Star	$\leq 465 + 1.378 \times V_{adj} \times 1.15$
2 Star	$\leq 1 \text{ Star} \times 0.77$
3 Star	$\leq 2 \text{ Star} \times 0.77$
4 Star	$\leq 3 \text{ Star} \times 0.77$

5.2.2. With a freezer

Star rate	Formula
1 Star	$\leq 465 + 1.378 \times V_{adj} \times 1.55$
2 Star	$\leq 1 \text{ Star} \times 0.77$
3 Star	$\leq 2 \text{ Star} \times 0.77$
4 Star	$\leq 3 \text{ Star} \times 0.77$

Testing the air conditioning devices performance should refer to SNI-ISO 04-15502-2008 or IEC 62552-2007. Energy efficiency rating criteria serves as base to determine the number of stars that should be included in the label.

Formula to determine the energy efficiency star rate:

Adjusted Volume (V_{adj}),

$$V_{adj} = \sum V_i \cdot \Omega$$

- V_i = storage volume in each compartment
- Ω = Load factor:

$$\Omega = \frac{T_a - T_i}{T_a - T_r}$$

- T_a = T class ambience temperature (32 °C based on SNI/ ISO 15502).
- T_i = Rated temperature in each tested compartment
- T_r = Rated temperature in fresh food compartment (5°C).

6. Data verification

6.1 Test Laboratory

Data for affixing energy efficiency labels must be obtained from an accredited/ equivalent laboratory. Certification of the government, third party and manufacturer’s laboratories is carried by KAN (ISO 17025) with a competence test to meet SNI 04-6710 (2002) and ISO 04-6711 (2002) standards.

The third party or manufacturer’s owned laboratory located overseas must meet ISO 5151 competency standards and certified by JRAIA (Japan Refrigeration and Air Conditioning Industry Association) or in accordance with ISO 17025 and certified by the competent authorities of the concerned country.

Competency and certification test that must be performed by a laboratory test in Indonesia and overseas are as follows:

Table 6.1-1 Test Laboratory Qualification in Indonesia

Laboratory	Competency test	Certification
Government	SNI 04-6710 (2002), SNI 04-6711 (2002)	ISO 17025 issued by KAN
Third party	SNI 04-6710 (2002), SNI 04-6711 (2002)	ISO 17025 issued by KAN
Manufacturer	SNI 04-6710 (2002), SNI 04-6711 (2002)	ISO 17025 issued by KAN

Table 6.1-2 Test Laboratory Qualification in Overseas

Laboratory	Competency test	Certification
Third party	IEC 62552 (2007)/ISO 15502 (2005)	ISO 17025 from competent authorities of the concerned country.
Manufacturer	IEC 62552 (2007)/ISO 15502 (2005)	ISO 17025 from competent authorities of the concerned country.
Countries: Japan , Korea, China, Thailand, Malaysia, India, US, and Canada		

6.2 Witness in Manufacturer's Laboratory

Testing performed in manufacturer's laboratories witnessed by the staff of laboratory that have been accredited, can replace the manufacturer's laboratory accreditation process. The presence of witnesses required for each type and model of the product. In cases where assessment of accredited laboratory recognize manufacturer's validity in measurement of energy efficiency, then the existence of witnesses for each type and model of the product can be replaced with an annual inspection. The annual inspection should include the testimony of actual product testing.

6.3 Testing Procedure

Testing procedures carried out as follows:

- 1) Verify that sample matches the specifications of the submission sheet
- 2) Take over the sample and sign the submission sheet
- 3) The samples are labeled that is filled according to the current condition of the sample
- 4) Tested samples are stored in sample storage area
- 5) Samples are stored until the complaint period validity is completed. Period of validity expires 3 months after test results submitted to the producers.

6.3 Validity Period of the Data

Test results data are valid for products sold in the markets of Indonesia. This does not include products sold in secondhand goods shops.

6.4 Inspection Test (Sample Test in the Market)

The government shall conduct inspection tests in order to maintain validity of the data displayed on the products and/or catalogs. Following method can be applied.

- Government conducts testing on government-owned test laboratory or accredited third party laboratory or laboratory that has equivalent qualifications.
- The governments testify to the tests performed in laboratories owned by manufacturers. Producers or manufacturers must invite a government witness, 3 times in one year.

Note:

“Third party laboratory” is a laboratory that has no business relationship with manufacturers whose products will be tested. The laboratory (local/oversea) must have the ability/ certification as described above.

6.5 Tolerance of EE Data

Energy efficiency data reported by the manufacturer at the time of applying for energy efficiency labels, or data displayed on products, packaging, and catalogs need to receive tolerance from the test data resulted from accredited test laboratory or data from the test testimony performed at manufacturer's owned laboratory, as tolerance value below:

Table 6.6-1 Tolerance data of energy efficiency test

Item	Test data	
	Label certification	Sample test in the market
Adjusted Inner Volume (Litter)	95%-105% x Declared data	95%-105% x Declared data
Maximum Power (kW)	110% x Declared data	110% x Declared data
Annual Power Consumption (kWh/year)	90% x Declared data	90% x Declared data

6.6 Test Reports

The entire test results must be stored and documented as Assessment Report, which contains refrigerator type, measurement data; ambience temperature, freezer temperature, fresh food compartment, cellar compartment temperature, power voltage, electricity consumption, performance cycle (24 hours on-off percentage). Copies of reports should be stored in a test laboratory as a reference.

7. Label Affixing Rules

7.1 Label Design

Basically, energy efficiency labels must comply with SNI 04-6958-2003 sized 80 square mm. With addition of some details as below:

- Model Number.
- Name of manufacturer
- Adjusted inner volume (Litter)
- Annual electricity consumption (kWh/year)
- Input power (W)

Energy efficiency label design for refrigerators products in Figure 7.1-1 below:

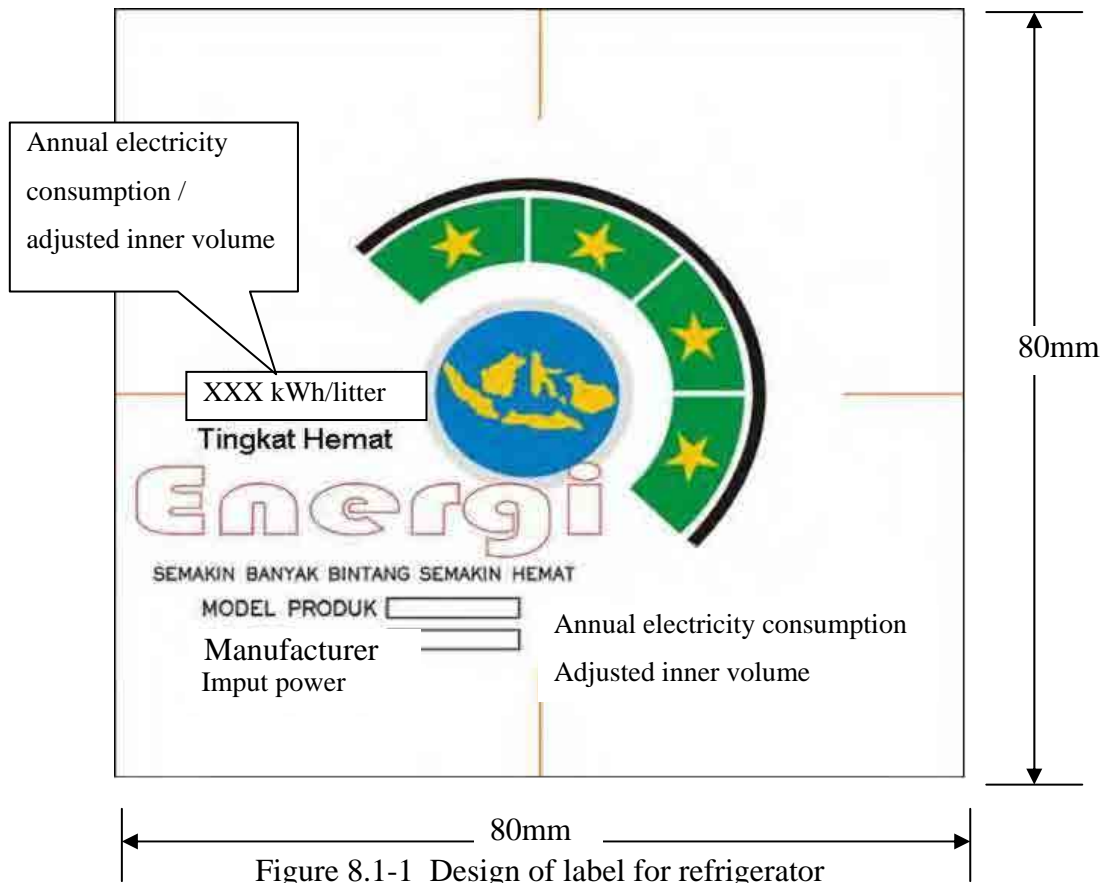


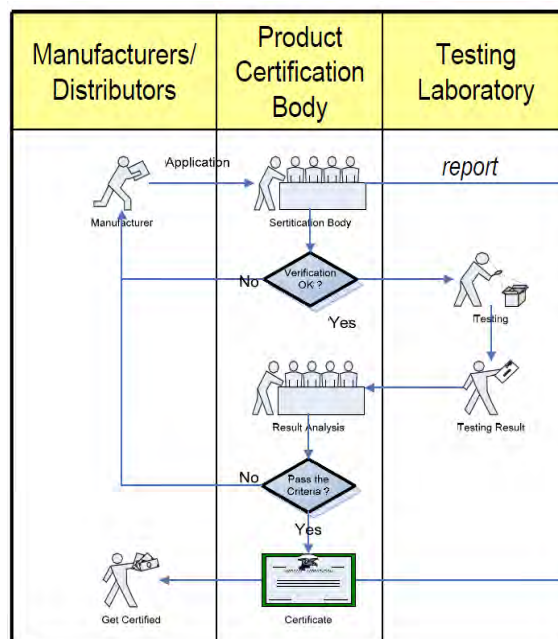
Figure 8.1-1 Design of label for refrigerator

7.2 Location

Labels must be placed on the front surface of refrigerator door, can also be displayed on the packaging, catalogs, web site pages, and other media without any size restriction.

7.3 Energy saving labeling Chart flow

Basically the chart flow of energy saving labeling on refrigerator products is as follows:



Explanation :

Request to affix labels on energy saving products started by Manufacturer or distributor. At the time of application, energy-efficient data is included as one of the requirements in the process. Energy saving tests performed in laboratory (described in point 6.1). For test report preparation refers to the explanation in points 7.3 and 7.4. The report is the basis of affixing energy efficient labels on refrigerators products.

8. Product Information

Besides EE labeling mentioned above, product information as listed below should be stated on the product, operation/maintenance document, catalogues, webpages, etc.

- Manufacturer's name / brand
- Model / type
- Batch Number
- Outside dimension
- *Gross Volume*
- Voltage
- Power
- Electricity flow
- Total *Gross Volume*
- Annual energy consumption
- Performance Frequency
- Refrigerant type

APPENDIX 1; Condition of Test and Calculation

1. Condition

- a. Testing Voltage is product's voltage with a tolerance of $\pm 1\%$
- b. Air conditioned room temperature is at 32 ± 1 degrees Celsius and relative humidity between 45% and 75%.
- c. The voltage frequency at the time of testing is 50 Hzd. Retrieval of measurement data is made when the conditions in the air conditioned room has been met and the temperature in each compartment of the refrigerator in a stable state:

2. Testing

- 2.1** Tests to determine linear dimensions and volume (see ISO 04-6710:2002 point 7.1 and 7.2)
- 2.2** Energy consumption test with/ without load (see SNI 04-6710:2002 point 15)
- 2.3** Temperature rise test (see SNI 04-6710:2002 point 16)

3. Necessary instrument:

- 3.1** Use temperature measuring instrument with an accuracy of ± 0.3 K.
Temperature should be measured by temperature measurer. The measured temperature should be noted or recorded.
- 3.2** Use the relative humidity measuring device which has an accuracy of $\pm 3\%$.
- 3.3** Use a kWh meter that reads to 0.01 kWh and its accuracy is $\pm 1\%$.
- 3.4** Use a Watt meter that reads up to 0.1 W and accuracy of $\pm 1\%$.

4. Preparation

- 4.1** Create a partition (as shown in Figure 1) following these steps:
Refer to the ISO, including the drawing. Prepare a wooden platform with top solid on the floor of the test chamber, measuring of 300 mm, and extended at least 300 mm, not more than 600 mm over all sides of equipment, except on the back that extends toward the vertical partition.
 - a) The bottom of the wooden platform should be open for air circulation.
 - b) Paint the top of the wooden platform with dark black color.
 - c) Prepare 3 vertical partitions which size is adjusted to dimensions of the refrigerator to be tested and then paint it black.
 - d) Put one of the partitions parallel to the back of the refrigerator to be tested, opposing to stops or a distance specified by the manufacturer in relation to the whole room.

- e) Put the two other partitions parallel to the side of the refrigerator to be tested and built on the platform measuring 300 mm from the side of the refrigerator; with 300 mm width.
- f) The three vertical partitions made without connection, the height should be t stand out at least 300 mm above the top of the refrigerator to be tested.
- g) Place the refrigerator to be tested in a partition that has been made in the air conditioned space

4.2 Prepare the necessary equipment to measure the use of current, power and energy of the refrigerators.

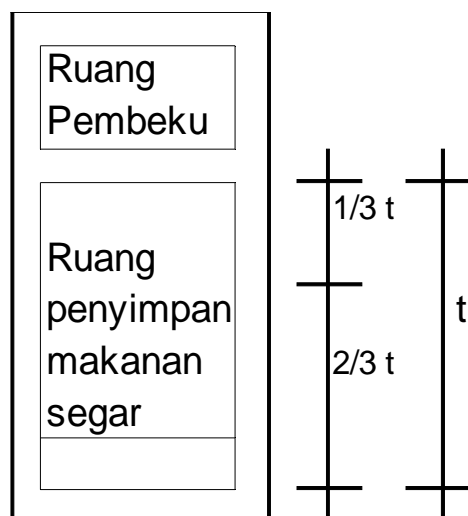
5. Measurement of Energy Consumption

5.1 Place the refrigerator to be tested between the partitions referring to Figure 1. Follow the ISO, including the drawing.

5.2 Place the temperature sensor at the measurement points on each refrigerator; in the frozen food (tf) and the fresh food (tm) compartments. Where to mount the temperature sensor in each refrigerator compartment is shown in Figure 2, Figure 3 and Figure 4.

5.3 Attach the ambient temperature sensor around the refrigerator, at two points (TA1 and TA2) at a distance of 350 mm from the vertical center line of the side wall, 1 m above the floor line (testing equipment configuration for refrigerators can be seen in Figure 5).

5.4 Make sure the thermometer (tm) placement is at $1/3 t$ of the bottom freezer, t is the distance to the bottom of the freezer compartment of refrigerator. For fresh food storage compartment, refrigerator Thermostat is set at a temperature of $5^{\circ} C$. Make sure the placement of thermometers (tf) is in the middle of frozen food storage compartment. Temperature is set depends on the type of frozen food storage compartment. (picture attached)



- 5.5** Connect the refrigerator to the power source.
- 5.6** Check and make sure the measurement data parameter is read properly.
- 5.7** Set the ambient temperature at a temperature of +32 °C for refrigerators class T. Temperature used to determine energy consumption must be within ± 1 °C.
- 5.8** Set the relative humidity between 45% and 75%
- 5.9** Measuring equipment should be adjusted to record data simultaneously and concurrently.
- 5.10** Ensure that the relative humidity between 45% and 75% air conditioned room has been
- 5.11** Measure / record temperature measurements at each of the refrigerator is in the frozen food (tf) and the fresh food space (tm), every 1 minute during the test period. Testing period performed at least for 24 hours after steady state is achieved.
- 5.12** Measure / record the ambient temperature around the refrigerator (TA1 and TA2) every 1 minute during the test period. Testing period performed at least for 24 hours after steady state is achieved.
- 5.13** Measure the power during the time of or during the steady state is achieved.
- 5.14** records the energy consumption during the test period. Period of test should last at least 24 hours after steady state is achieved.
- 5.15** Perform recorded data analysis to find energy consumption in 24 hours of (kWh). Energy consumption is calculated based on the amount of energy in a day (kWh/24 hours).

FRAMEWORK
ENERGY EFFICIENCY LABELING PROGRAM
PART 3: TECHNICAL PROVISION
for
AC (Air Conditioner)
(DRAFT) Rev. 3rd

November, 2011

Prepared by;
Technical Meeting for EE Labeling Program in Indonesia

1. Scope and Product Type

The scope of the air conditioners without channel is a sealed unit that is designed, to be mounted on a window, or on a wall, or as a console that is designed primarily to deliver conditioned air freely into an enclosed room or rooms (air conditioned space), and includes in which the main source of refrigeration for cooling and humidity reducing. Type and scope of products, as in the table below:

Table 1-1 Type and scope of AC labeling product

Type	Cooling capacity
<i>Split, Wall Mounted type</i>	Max. 27,000BTU/h (7,913kW)

2. Category

Star rating criteria and measurement methods should be based on the following categories:

Table 2-1 Category of labeling on AC

	Measurement Methods	Star rating criteria
Category	1. Non-inverter type 2. Inverter type	1. Non-inverter type 2. Inverter type

3. Energy efficiency indicator

Indicator of energy efficiency is determined by the COP (Coefficient of Performance). COP is a result of dividing the cooling capacity with air conditioner's power consumption. Measurements on both types of air-conditioners are:

- a. Non-inverter type: Measuring at full load, and the indicators used are full-load COP
- b. Inverter Type: Measuring at full load and at half load. The indicator used is COP weighted, with the formula:

$$\text{COP weighted} = 0.4 \times \text{COP (100\% load)} + 0.6 \times \text{COP (50\% load)}$$

4. Measurement Method Reference

Measurement method of energy efficiency indicators for air conditioner should be conducted in accordance to the following table:

Table 4-1 Measurement Method Reference for AC

No.	Category/ Type	Measurement Method Reference
1	Non-Inverter Type	SNI 19-6713-2002 as the adoption of ISO 5151 for full load cooling capacity
2	Inverter Type	ISO 5151 for full load cooling capacity. Test at 50% load to be carried out, paying attention to rotation of the compressor and maintain cooling at 50% load.

5. Energy Efficiency Rating Criteria

Energy efficiency rating criteria is based on the value of Coefficient of Performance (COP). COP is a result of dividing cooling capacity with AC power consumption. COP measurements are:

- a. Non-inverter type: Measuring at full load, and the indicator used is full-load COP.
- b. Inverter Type: Measuring at full load and at half load. The indicator used is COP loading, with the formula:

$$\text{COP weighted} = 0.4 \times \text{COP (100\% load)} + 0.6 \times \text{COP (50\% load)}$$

50% load is determined based on the AC condition while producing a minimum of 95% from 50% listed nominal capacity.

Criteria to determine the energy-saving rate is taken from the COP test results as in the following table:

Table 5-1 Energy efficiency rating criteria

Type	*	**	***	****
Inverter (COP weighted)	$2,64 \leq \text{COP} < 2,92$	$2,92 \leq \text{COP} < 3,34$	$3,34 \leq \text{COP} < 3,76$	$3,76 \leq \text{COP}$
Non-inverter	$2,50 \leq \text{COP} < 2,64$	$2,64 \leq \text{COP} < 2,92$	$2,92 \leq \text{COP} < 3,05$	$3,05 \leq \text{COP}$

EER in accordance with the catalog and star rating as shown below:

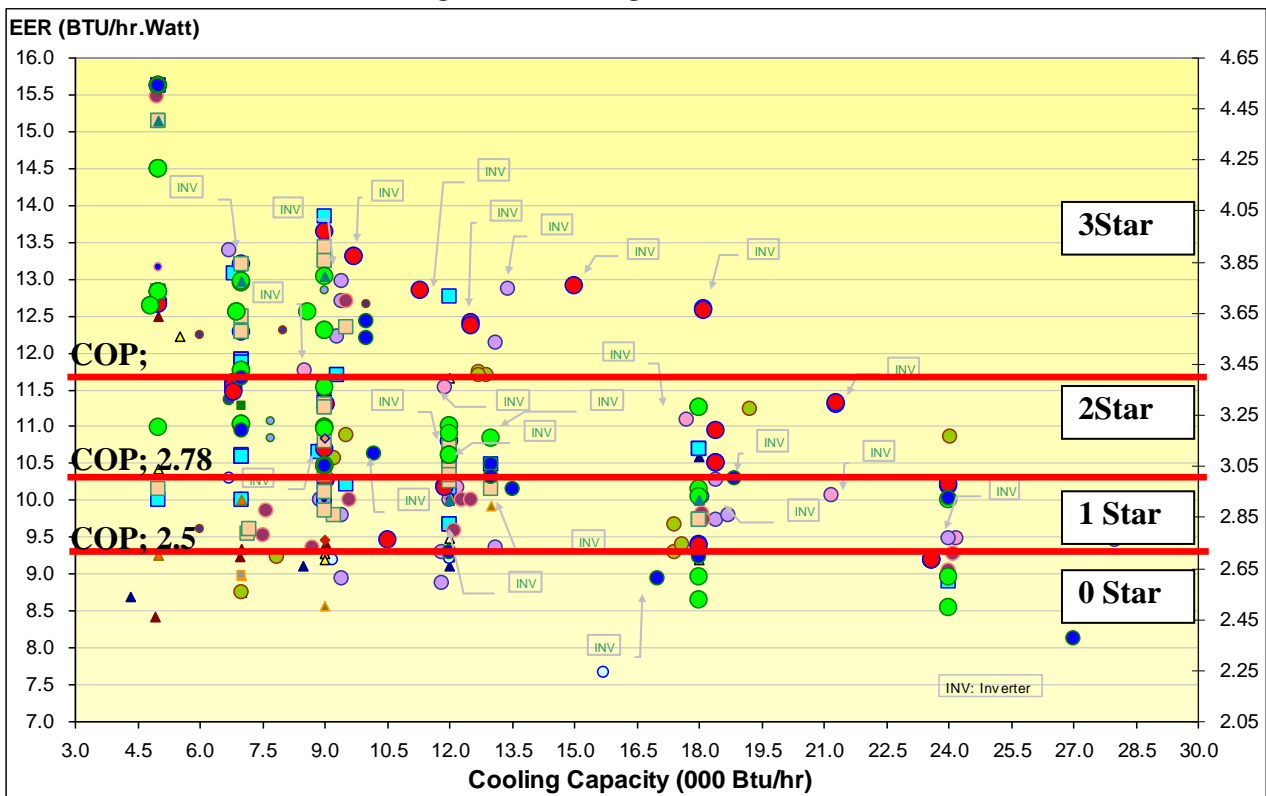


Figure 5-1 Non inverter AC Star Rating

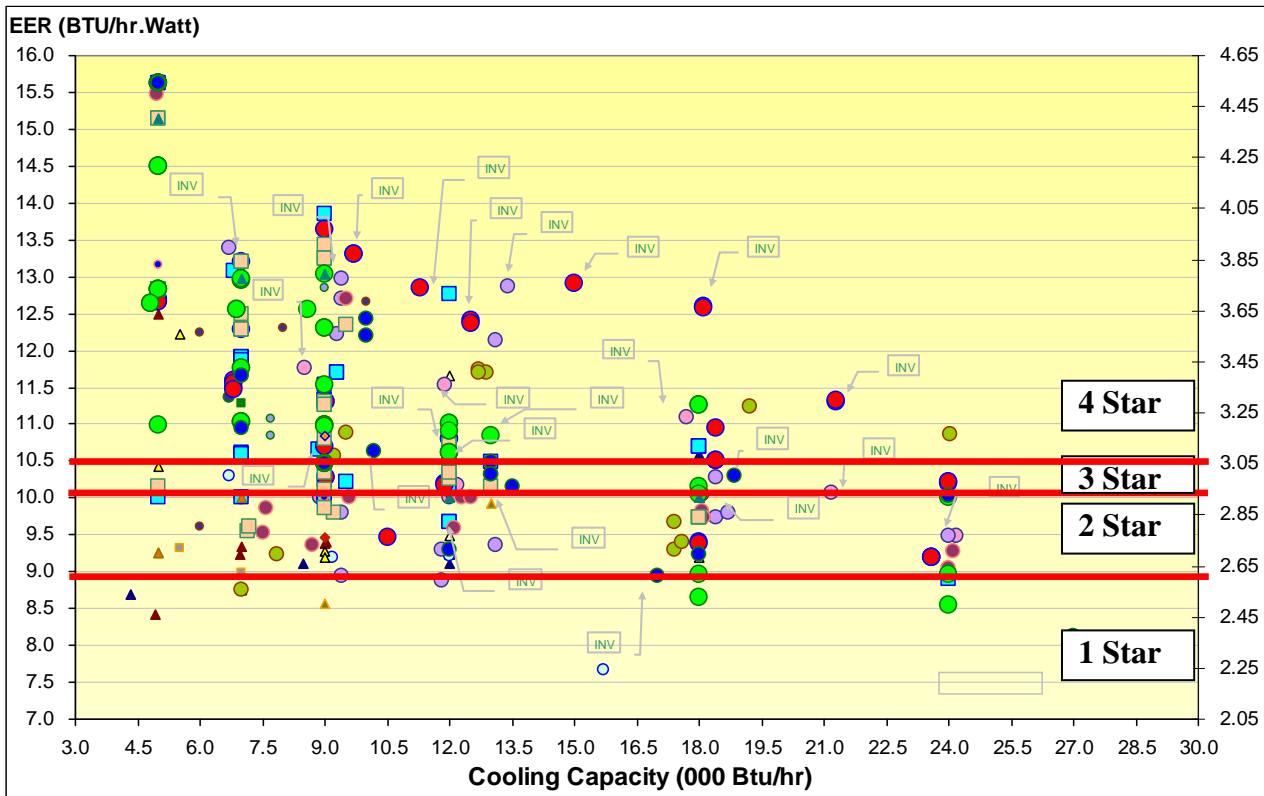


Figure 5-2 AC inverter star rating (based on COP)

6. Data Verification

6.1 Laboratory test

To affix energy-efficiency label, data must be obtained from an accredited/ equivalent laboratory. Government laboratories and third-party manufacturers can be an accredited/ equivalent laboratory. Certification of government and third-party manufacturers laboratory is carried by KAN (ISO 17025) or Japan Refrigeration and Air Conditioning Industry Association or by CSA (Canada Standards Association), with a test of competence to meet standard of SNI 19-6713 - 2002 or ISO 5151.

Laboratory owned by a third party or manufacturer located outside Indonesia must meet the ISO 5151 standards and certified by JRAIA (Japan Refrigeration and Air Conditioning Industry Association) or according to ISO 17025 and certified by the competent authorities in the concerned country.

Competency test and certification that must be performed by a laboratory test in Indonesia are as follows:

Table 6.1-1 Testing Laboratory Qualification (Indonesia)

Laboratory	Competency test	Certificate
Government	ISO 5151	ISO 17025 published by KAN, or certificate issued by JRAIA, CSA
Third party		
Manufacturer		
Note: JRAIA: the Japan Refrigeration and Air Conditioning Industry Association CSA: Canada Standard Association		

For overseas laboratories, competency testing and certification that must be done:

Table 6.1-2 Testing Laboratory Qualification (Oversea)

Laboratory	Competency test	Certificate
Third party	ISO 5151	ISO 17025 issued by authorities in concerned countries (refer to note), or certification issued by JRAIA, CSA
Manufacturer		
Note: Japan, Korea, China, Thailand, Malaysia, India, US and Canada		

6.2 Witness Test at Manufacturer's Laboratory

Tests conducted in the manufacturer laboratory and witnessed by an accredited laboratory staff, can replace manufacturers laboratory accreditation mentioned in point 6.1. The presence of witnesses required for each type and model of the product. In cases where assessment of accredited laboratory recognize manufacturer's validity in measurement of energy efficiency testing, then the existence of witnesses for each type and model of the product can be replaced with an annual inspection. The annual inspection should include the testimony of the actual product testing.

6.3 The validity of test results

Test results data are valid for products sold in the markets of Indonesia. This does not include products sold in secondhand goods shops.

6.4 Inspection test (Sample Test in the Market)

The government shall conduct inspection tests in order to maintain validity of the data displayed on the products and/or catalogs. Following method can be applied.

- Government conducts testing on government-owned test laboratory or accredited third party laboratory or laboratory that has equivalent qualifications.
- The governments testify to the tests performed in laboratories owned by manufacturers. Producers or manufacturers must invite a government witness, 3 times in one year.

Note:

“Third party laboratory” is a laboratory that has no business relationship with manufacturers whose products will be tested. The laboratory (local/oversea) must have the ability/certification as described above.

6.5 Tolerance data of energy efficiency test

Energy-efficiency data reported by the manufacturer at the time of applying for energy-saving labels, or data displayed on products, packaging, and catalogs need to receive tolerance from the test data resulted from accredited test laboratory or data from the test testimony performed at manufacturer’s owned laboratory, as tolerance value below:

Table 6.5-1 Tolerance data of energy efficiency test

Item	Test Data	
	Label certification	Sample test in the market
Minimum Cooling Capacity (kW)	95% x Declared data	90% x Declared data
Maximum Power (kW)	110% x Declared data	110% x Declared data
Minimum COP listed value	90% x Declared data	90% x Declared data
Weighted COP value/ minimum (EER)	90% x Declared data	90% x Declared data

6.6 Test Reports

The entire test results must be stored and documented as Assessment Report, which contains the results of measurement data, performance characteristics and other details including necessary retest reports. Copies of reports should be stored in a test laboratory as a reference. Test report format enclosed in Appendix-1.

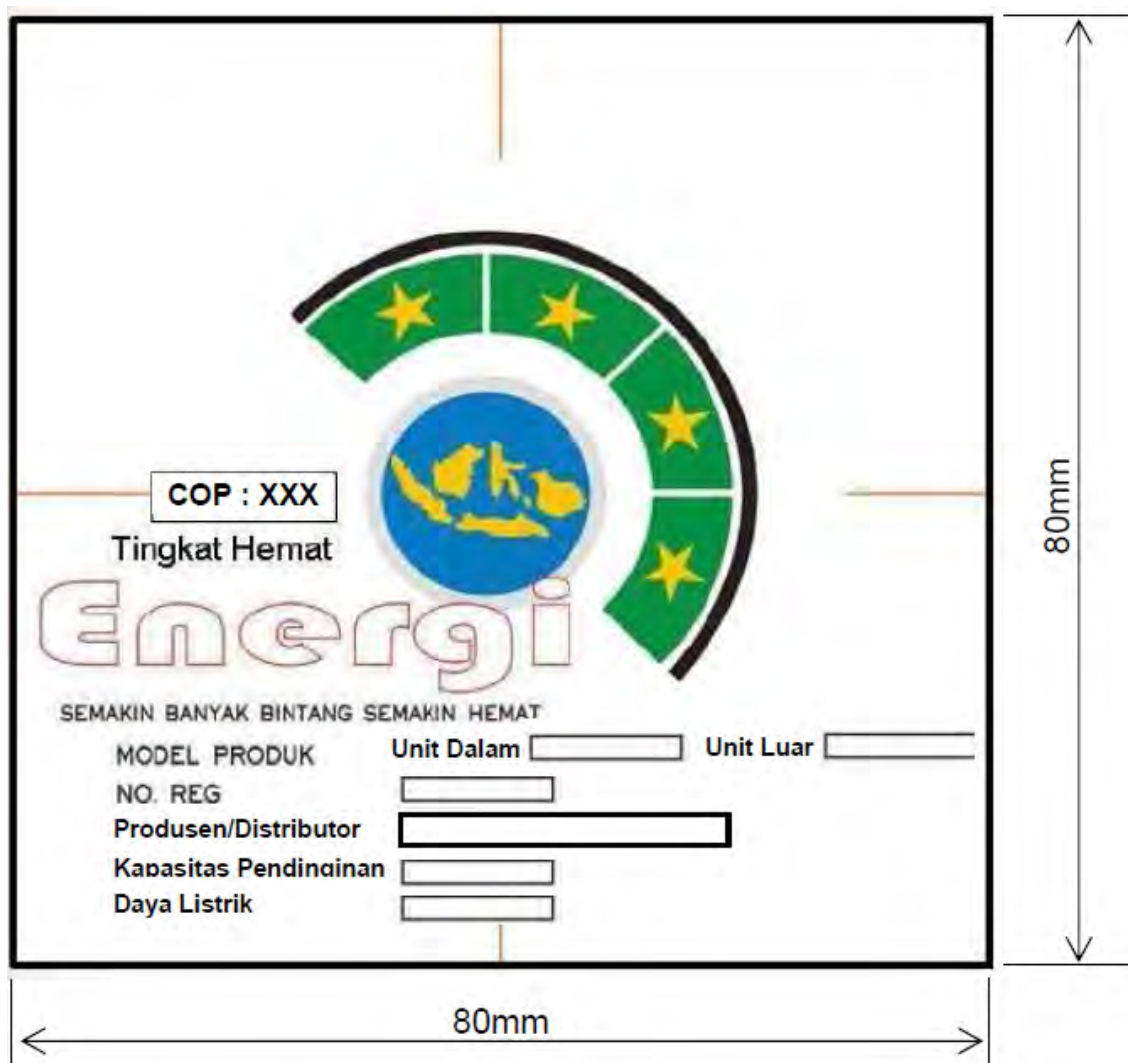
7. Label Affixing Rule

7.1 Label Design

Basically, energy-saving labels must comply with SNI 04-6958-2003 with the addition of some details as below:

- COP
- Product Model, either indoor/ outdoor model unit
- Register Number
- Name of Manufacturer or Distributor
- Cooling Capacity (kW)
- Power (kW)

Energy-efficiency label design for air conditioning products in Figure 7.1-1 below:



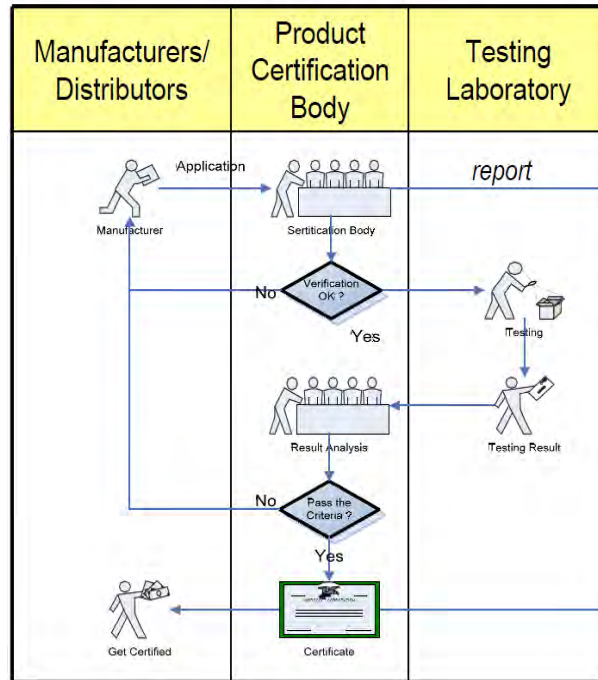
Picture 7.1-1 AC design label

7.2 Placement of Energy-efficient label

Labels must be placed on the front surface of indoor unit, can also be displayed on the outdoor unit, packaging, catalogs, web site pages, and other media without any restriction in size.

7.3 Energy saving labeling Chart flow

Basically the chart flow of energy saving labeling on air conditioning products is as follows:



Explanation:

Request to affix labels on energy saving products started by Manufacturer or distributor. At the time of application, energy-efficiency data is included as one of the requirements in the process. Energy saving tests performed in laboratory (described in point 6.1). For test report preparation refers to the explanation in points 7.3 and 7.4. The report is the basis of affixing energy efficiency labels on air conditioner products.

Attachment-1

a. Test report: Calorimeter method

TEST REPORT of AIR-CONDITIONER (CALORIMETER METHOD)

Air-Conditioner test report:

Report code:

Part 1: Test Laboratory

1) Date of test (day/month/year)	
2) Name of Laboratory	
3) Location of test Laboratory	
4) Name of Tester	
5) Head of Laboratory	

Part 2: Product Specification

1) Brand		
2) Indoor unit model		
3) Outdoor unit model		
4) Country of origin		
5) Refrigerant		
6) Refrigerant load (kg)		
7) Volt (V)		
8) Frequency (Hz)		
9) Electricity (A)		
10) Inside Unit weight / Unit Luar (kg)		
11) Dimension of (inside) Unit (h x w x d) (mm)		
12) Dimension of (outside) Unit (h x w x d) (mm)		
13) Cooling capacity (W)		
14) Power (W)		

Part 3: Cooling capacity test

1) Test Standard	
2) Test Method	Calorimeter

	100% load	50% load ¹
3) Volt (V)		
4) Frequency (Hz)		
5) Electric flow (A)		
6) Time of test (hr)		
7) Total cooling capacity (W)		
8) Sensible cooling capacity (W)		
9) Latent cooling capacity(W)		
10) Total power (W)		
11) COP - Coefficient of Performance (W/W)		
12) Barometric pressure (kPa)		
13) Inside Unit: Fan felocity (s) (RPM)		
14) Inside Unit: Airflow velocity (m ³ /s of standard air)		
15) External Resistance of airflow in Inside Unit (Pa)		
16) Airflow Volume that goes through measuring nozzle (m ³ /s)		
17) Static air pressure difference that separates calorimeter compartment (Pa)		
18) Temperature of Dry and wet ball (° C) (The compartment inside calorimeter)		
19) Temperature of Dry and wet ball (° C) (The compartment outside calorimeter)		
20) The average air temperature outside the calorimeter (° C)		
21) The amount of water that evaporates in Humidifier (kg)		
22) Cooling water flow rate that go through Outside compartment of coil heat-rejection (P/s)		
23) Cold water flow temperature rate that go through Outside compartment of coil heat-rejection (P/s)		
24) Cold water flow temperature rate that go through outside of Outside compartment of coil heat-rejection (P/s)		
25) Mass of condensed water from product (kg)		
26) Condensed water temperature (°C)		

¹ Inverter type AC only

Part 4: Sign

- Name and signature of tester in charge of testing
- Date :

Attachment A – Photo

- Color photos that show the inside and outside units of tested products
- Color photos that show the number of connectors on the outside unit
- Color photo of the product nameplate

Attachment B – Schema

The schematic image that clearly shows the of the main components of the product

Attachment C – Component list

Technical specifications and product's main components list

b. Test Report for Air-Enthalpy Method

**TEST REPORT FOR AIR-CONDITIONER
(AIR-ENTHALPY METHOD)**

Test Report of Air-Conditioner Model :

No. Report:

Part 1: Laboratory Test

1) Date of test (day/month/year)	
2) Name of Laboratory	
3) Location of test Laboratory	
4) Name of Tester	
5) Head of Laboratory	

Part 2: Product Specification

1) Brand	
2) Indoor unit model	
3) Outdoor unit model	
4) Country of origin	
5) Refrigerant	
6) Refrigerant load (kg)	
7) Volt (V)	
8) Frequency (Hz)	
9) Electricity (A)	
10) Inside Unit weight / Unit Luar (kg)	
11) Dimension of (inside) Unit (h x w x d) (mm)	
12) Dimension of (outside) Unit (h x w x d) (mm)	
13) Cooling capacity (W)	
14) Power (W)	

Part 3: Cooling Capacity test

a) Standard Test	
b) Method Test	Air enthalpy

	100% load	50% load ¹
3) Volt (V)		
4) Frequency (Hz)		
5) Total Ampere (A)		
6) Time of test (hr)		
7) Total cooling capacity (W)		
8) Sensible cooling capacity (W)		
9) Latent cooling capacity(W)		
10) Total power (W)		
11) COP - Coefficient of Performance (W/W)		
12) Barometric pressure (kPa)		
13) Inside Unit: Fan velocity (s) (RPM)		
14) Inside Unit: Airflow velocity (m ³ /s of standard air)		
15) External Resistance of airflow in Inside Unit (Pa)		
16) Airflow Volume and all measurement related to calculation (m ³ /s)		
18) Temperature of dry ball air that goes to inside Unit (°C)		
19) Temperature of wet ball air that goes to inside Unit (°C)		
20) Temperature of dry ball air that goes outside inside Unit (°C)		
21) Temperature of wet ball air that goes outside inside Unit (°C)		
22) Temperature of dry ball wet ball of outside Unit (°C)		

¹ Only for Inverter type AC

Part 4: Sign

- Name and signature of tester in charge of testing
- Date :

Attachment A – Photo

- Color photos that show the inside and outside units of tested products
- Color photos that show the number of connectors on the outside unit
- Color photo of the product nameplate

Attachment B – Schema

The schematic image that clearly shows the of the main components of the product

Attachment C – Component list

Technical specifications and product`s main components list

**PROCEDURE and REQUIREMENTS
of
PERFORMANCE TEST on TV (Television)
for
THE PURPOSE of ENERGY SAVING LEVEL
LABELLING**

**Result of 3rd WG of TV on 26 October 2011
(DRAFT)**

November, 2011

Prepared by;

Technical Meeting for EE Labeling Program in Indonesia

Department of energy mineral resources of the republic of Indonesia directorate general of electricity and energy utilization Jakarta, 2011

1. Scope

Procedures and requirements of performance test of this energy consumption for household television use electrical energy.

The scope of this performance test includes:

- Determining the size of the screen linear dimensions
- Energy consumption during operation
- Energy consumption during stand-by

2. Objective

The purpose of procedures and requirements performance test of this energy consumption is to determine the level of energy efficiency of the television according test conditions established, for the purpose of affixing labels energy-efficient level of SNI 04-6958-2003.

3. Reference

This procedure refers to:

- IEC 62301 (2006)
- IEC 62087 (2008)
- JIS C 6101 → check the JIS version
- SNI 04-6253-2003 (Safety Audio Video)
- SNI 04-6958-2003

4. Definition

a) Product

The product is limited to a TV set LCD TV (Liquid Crystal Display TVs), plasma TVs, and TVs LED (Light Emitting Diodes TV) that use an AC power source voltage with a frequency of 50Hz and 220V

b) Manufacturer (manufacturing)

Manufacturing is the industry producing the product

c) Importer

Importers are the people who import goods and then sell it in Indonesia.

d) Retailers

Retailers are the people who sell goods to consumers directly.

e) Energy label

Energy label is an indication of energy efficiency performance presented / displayed on products made by manufacturers or importers.

f) Energy efficiency performance

Energy efficiency performance is the level of electricity consumption of a unit kWh / year.

g) Test laboratory

Test Laboratory should demonstrate measurement of energy performance and data submitted refers to the label certification based on established methods and procedures. Laboratory tests must be accredited by KAN.

5. Methods of measuring energy efficiency performance

5.1 Determination of energy consumption efficiency

Efficiency of energy consumption expressed in the value of kWh / year, calculated by the formula:

$$E = \frac{(P_o - \frac{PA}{4}) \times t1 + Ps \times t2}{1000}$$

In this formula, E, Po, Ps, PA, t1, t2 are representing:

E: Annual energy consumption [kWh / yr]

Po: Operational Power [W]

Ps: Power on standby [W]

PA: The reduction in power consumption due to energy-saving function [W]

t1: annual operating standard time [hours] 2920 (365 days × 8 hours)

t2: annual standby condition standard time [hours] 5840 (365 days × 16 hours)

5.2 Amount of test sample

It takes two sample tests. The result of measurements taken from the lower value.

5.3 Measurement Method

5.3.1 Power Operations

5.3.1.1 Static Power Operations; Po (W)

Operational power is the average electrical power consumed by TV while producing flat level white signal (Pw) and the TV power consumption when producing flat level black signal (Pb). For LCD TVs, Plasma TVs, LED TVs, the average value calculated beside the power consumption on the two conditions, plus the power consumed by TV when producing color line signal (Pc) and the three colors lines signal (Pt). All measurements were conducted during the energy saving function is not active. So that the operational power to the TV can be calculated by the following formula:

$$\text{LCD TVs, Plasma TVs, and LED TVs} : P_o = \frac{\frac{P_w + P_b}{2} + P_c + P_t}{3}$$

5.3.1.2 Operational Dynamic Power; Po (W)

Measurements using a dynamic broadcast video signal content.

Full duration of "The dynamic broadcast-content video signal" signal is used to measure TV power consumption when the television is used to view the content of broadcast TV. The measurement results must average power consumed for ten minutes in a row.

"The dynamic broadcast-content video signal" should be used to produce stability and measurement and shall be produced from one source of video content available from the IEC in a compatible format with the set input being tested.

(see IEC 62087:2008 content DVD 50 through IEC 62087:2008 Video content BD) video signal with a duration of ten minutes.

5.3.2 Power on standby; Ps (W)

Power on standby mode is the average power consumed when the TV is turned off from the main button (PS1) and the power consumed when switched off using the remote control on the main key condition is still on. If the TV can only be turned off / turned on by using one way, then the standby power used the power consumed when the button is turned off

$$P_s = \frac{P_{s1} + P_{s2}}{2}$$

5.3.3 Decrease in power consumption for energy efficiency function; PA (W)

Decrease in power consumption due to energy saving function is taken from a larger value between the PA1 or PA2, when the video signal at signal color line.

(a) PA1: reduced power consumption automatically due to adjustment of lighting levels in the vicinity (called "automatic adjustment of brightness function") (W).

PA1 is the difference between the power consumption when vicinity lighting level is equal to 0 lx (PA1Min) with the smallest power consumption when the vicinity lighting level is bigger or equal to 300 lx and energy saving function is turned off (PA1Max).

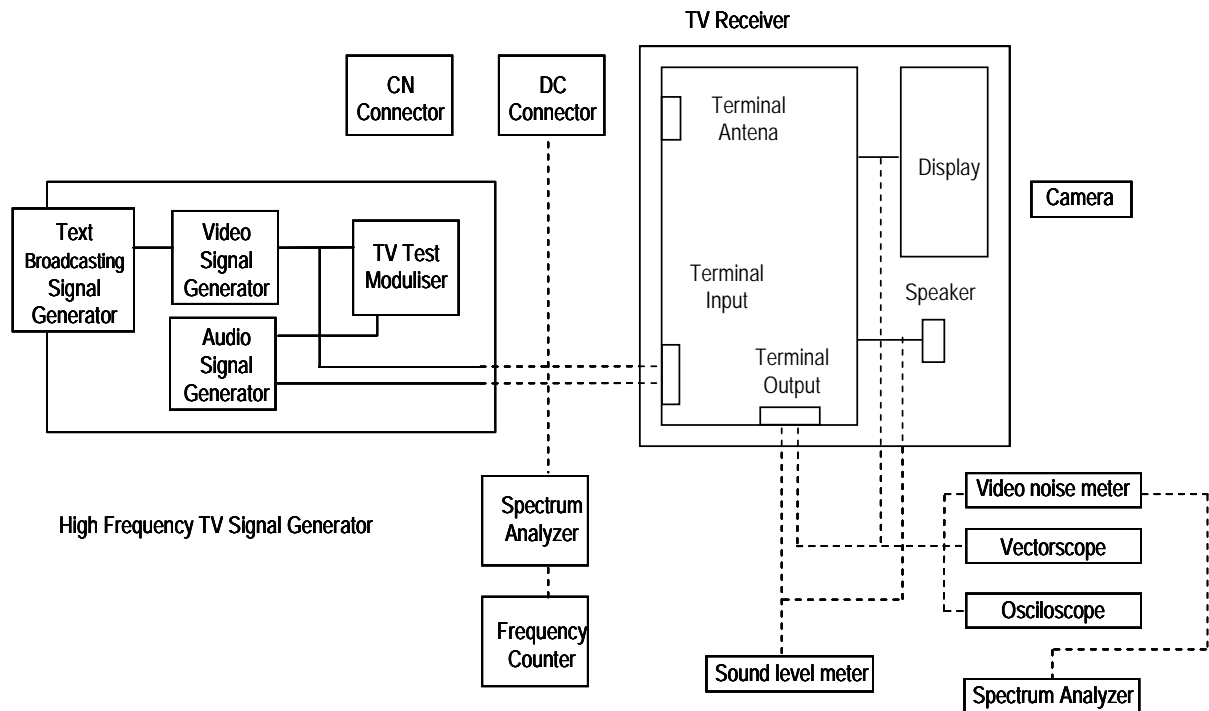
$$P_{A1} = P_{A1Max} - P_{A1Min}$$

(b) PA2: reduced power consumption through the energy savings button (W)

PA2 is the difference between the power consumption when energy saving function is turned on (PA2Min) and power consumption when energy saving function is turned off (PA2Max).

$$P_{A2} = P_{A2Max} - P_{A2Min}$$

5.4 The used equipment



Measurement:

a) Spectrum Analyzer, b) Frequency Counter, c) Video Noise meters, d) Vectorscope, e) Oscilloscope, f) Lx-meter, and g) Sound Level Meter were confirmed by the respective manufacturer of next week (June 22, 2011)

5.5 Measurement Condition

5.5.1 Voltage and Frequency Action: accordance with the standard AC

voltage 220 V + 10%, 50Hz.

5.5.2 Temperature and Humidity

Temp: 20 - 35oC

Humidity: 45-75%

5.5.3 Input Signal

Power consumption measurements conducted with the input signal as follows

5.5.3.1 Measurement with the input signal through a terrestrial wave band signal (analog or digital) or baseband signal.

- (1) Video Input Signal: flat level white signal, flat level black signal, the color line signal and three colors signal line, refer to JIS C6101-1 (checked how many %). TV Condition when the input signal shown in the following pictures:



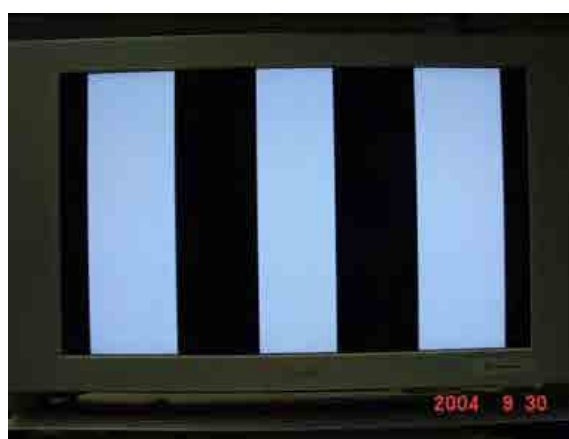
Picture of flat level white signal



Picture of flat level black signal



Picture of color line signal



Picture of three color line signal

- (2) Audio Input Signals: sinusoidal signal with a frequency of 1kHz, at level 150 mVr.ms

(3) Analog Input Signal:

a. Through terrestrial wave band signal

Signal level used is equal to 70 dB (UV) measured at 75Ω input terminal. This value is equivalent to the power of -39dB (mW)

b. Through the baseband signal

Baseband input voltage is measured at baseband terminals at 1 Vp-p against a white signal level flat.

(4) Input Signal Digital: the input signal used is a signal that accordance with standard transmission method used by digital TV broadcasting stations and high-definition broadcasts. Input signal level is -49 dB (mW).

5.5.3.2 Measurement with input via satellite broadcast wave signal (analog or digital)

I. Video Input Signal: flat level white signal, flat level black signal, color line signal and three colors line signal , refer to JIS C6101-1.

II. Audio Input signal: 1kHz sinusoidal signal with modulation factor from PCM for -18dB compared to the peak point.

III. Signal which converted into intermediate frequency accordance with the transmission method standard and high definition by satellite broadcasters.

IV. Signal which converted into intermediate frequency accordance with the transmission method standard and high definition TV broadcast by the station, ultra short-wave broadcasts, and broadcasts the data with a frequency range between 11.7-12.2 GHz. Input signal level of -45dB (mW).

5.5.4 The value of contrast, brightness and backlight

For the measurement of Po and Ps, the TV settings must be set so that power consumption when receiving flat level white signal is the maximum.

5.5.5 Output Audio

TV audio output must be set in such way to produce the output power of 50 mW with a 1 kHz audio input signal.

5.5.6 Additional Functions

A variety of additional functions which can be on and off by themselves should be turned off first.

5.5.7 Measurement

Measurements conducted during the TV condition were stable (minimum 15 minutes). For plasma TVs, measurements were carried out before the fire protection function is activated.

6. Television's Energy-efficiency Level Criteria

Star rating criteria shall be given in the following table.

Table 6-1 Star rating criteria

Star rating	Energy efficiency indicator (E)
4 Star	$E < 65 + 0.047 * SA$
3 Star	$65 + 0.047 * SA < E < 82 + 0.058 * SA$
2 Star	$82 + 0.058 * SA < E < 102 + 0.073 * SA$
1 Star	$102 + 0.073 * SA < E < 128 + 0.091 * SA$
0 Star	$128 + 0.091 * SA < E$

SA = Screen Area (cm²)

7. Testing report

The entire test results must be stored and documented in Assessment Report, which contains the results of measurement data, performance characteristics and details of all the obstacles that occur, damage or retest. Copies of reports should be stored in a test laboratory as reference.

添付資料 2

パイロットプロジェクト関係

添付 2-1 : インドネシア市場における各社 CFL の力率


添付 2-2 : 配布した質問表

添付 2-3 : 主な家電商品の普及率

添付 2-4 : 調査対象施設

添付 2-5 : 調査対象住宅における所有家電の詳細

添付 2-2 : 配布した質問表

	QUESTIONNAIRE Household Sector (To Support National Energy Efficiency Program and Energy Saving Awareness)
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Objective:	To Contribute in Implementing National Energy Efficiency Programs through Study on Electricity Demand Evaluation and Consumer Awareness on Energy Saving.
Surveyor Company:	B2TE - BPPT
Name of Surveyor:	

Date of Survey:	
Name of Respondent:	
Address and Phone Number (home/mobile):	
Status of Respondent:	<input type="checkbox"/> Husband <input type="checkbox"/> Wife <input type="checkbox"/> Son/Daughter <input type="checkbox"/> Home Owner <input type="checkbox"/> Family/Relatives <input type="checkbox"/> Home Loaner
Respondent Education:	<input type="checkbox"/> Some School <input type="checkbox"/> High School Graduate <input type="checkbox"/> Some College <input type="checkbox"/> University/College Graduate <input type="checkbox"/> Others
Respondent Job:	<input type="checkbox"/> Private employee <input type="checkbox"/> Government employee <input type="checkbox"/> Private Business <input type="checkbox"/> Others
Number of Family: (living in the same address)
Monthly Income (Rp.):	<input type="checkbox"/> < 3 million <input type="checkbox"/> 3 ~ 5 million <input type="checkbox"/> > 5 million
Monthly Expenditure (Rp):	<input type="checkbox"/> < 500.000 <input type="checkbox"/> 500.000 ~ 1 million <input type="checkbox"/> > 1 million
Type of Residential:	<input type="checkbox"/> Single House <input type="checkbox"/> Housing Estate <input type="checkbox"/> Others.....
Area of House:	<input type="checkbox"/> ≤ 36 m ² <input type="checkbox"/> >36 ~ 70 m ² <input type="checkbox"/> > 70 m ²
Electricity Contract:	<input type="checkbox"/> 450 VA <input type="checkbox"/> 900 VA <input type="checkbox"/> 1300 VA <input type="checkbox"/> 2200 VA <input type="checkbox"/> ≥ 6600 VA
Customer ID:
Annual and Monthly Electricity Consumption and Cost:kWh/year (average), Rp. /year (average)kWh/month (average), Rp. /month (average)
Number of Low Power Factor CFL distributed	<input type="checkbox"/> 8 Watt <input type="checkbox"/> 12 Watt <input type="checkbox"/> 15 Watt <input type="checkbox"/> 20 Watt <input type="checkbox"/> Watt (total)
Number of High Power Factor CFL distributed	<input type="checkbox"/> 8 Watt <input type="checkbox"/> 12 Watt <input type="checkbox"/> 15 Watt <input type="checkbox"/> 20 Watt <input type="checkbox"/> Watt (total)

No	How to manage the use of electrical appliances in your house	
1	Before you buy the electrical appliances	Do you think of the limiter trip and consider it? <input type="checkbox"/> No <input type="checkbox"/> Yes Where do you get the information about the appliances you want to buy? <input type="checkbox"/> from the catalogue <input type="checkbox"/> from your family or friend <input type="checkbox"/> from the seller (shop staff) or <input type="checkbox"/> other
2	Trip	<u>Because of the limited power</u> : <input type="checkbox"/> Never <input type="checkbox"/> Sometimes (1-3 time in a month) <input type="checkbox"/> Often (more than 3 times in a month) <u>Because of PLN</u> : <input type="checkbox"/> Never <input type="checkbox"/> Sometimes (1-3 time in a month) <input type="checkbox"/> Often (more than 3 times in a month)
3	In case of often trip because of the limited power	Do you turn off other electrical equipments to avoid the limiter trip? <input type="checkbox"/> No <input type="checkbox"/> Yes Do you think of the usage time and consider it to avoid the limiter trip? <input type="checkbox"/> No <input type="checkbox"/> Yes



QUESTIONNAIRE Household Sector

(To Support National Energy Efficiency Program and Energy Saving Awareness)

No	Electrical Appliances														
1.	Lighting fittings:	CFL			Incandescent			Linear FL (T10/T12)			Oil Lamp		Others.....		
	 points		 points		 points		 points	 points		
	Lighting :	CFL			Incandescent			Linear FL (T10/T12)			Oil Lamp		Others.....		
		Watt	Num.	hour/ day	Watt	Num.	hour/ day	Watt	Num.	hour/ day	Num.	hour/ day	Watt	Num.	hour/ day
2.	Refrigerator:	a) Number;, b) Capacity;,liter c) Brands;, e) Input Power;,W, f) Doors;,, g) Purchasing year;(.....years ago)													
3.	Television (TV):	<input type="checkbox"/> CRT <input type="checkbox"/> LCD <input type="checkbox"/> Plasma Number;, Size;,inch, Brands;,, hours/day;, Input Power;,W, Purchasing Year;, (1 / 2 /,years ago)													
4.	Air Conditioner (AC):	<input type="checkbox"/> No <input type="checkbox"/> Yes, if yes, filled out the followings; <input type="checkbox"/> Split <input type="checkbox"/> Window Number;, Capacity;,,PK, Brands;,, Input Power;,,W, COP / EER;,,, Hours/day;,, Purchasing Year;,, (1 / 2 /,, years ago)													
5.	Washing Machine:	<input type="checkbox"/> No <input type="checkbox"/> Yes, Type; 1 / 2 drums, Input Power;W, Hours/day; (average)													
6.	Rice Cooker /Magic Jar:	<input type="checkbox"/> No <input type="checkbox"/> Yes, Type; big / small, Input Power;W, Hours/day; (average)													
7.	Dispenser:	<input type="checkbox"/> No <input type="checkbox"/> Yes, Type; no electricity / hot & cold, Input Power;W													
8.	Kitchen Cooker:	<input type="checkbox"/> No <input type="checkbox"/> Yes, Type; gas / electric, Input Power;W, Hours/day; (average)													
9.	Water Pump:	<input type="checkbox"/> No <input type="checkbox"/> Yes, Type; manual / automatic control, Input Power;W, Hours/day; (avrg)													
10.	Personal Computer:	<input type="checkbox"/> No <input type="checkbox"/> Yes, Number;, Hours/day; (average)													
11.	Water Heater :	<input type="checkbox"/> No <input type="checkbox"/> Yes, Type; gas / electric, Input Power;W, Hours/day; (average)													
12.	Electric Iron:	<input type="checkbox"/> No <input type="checkbox"/> Yes, Input Power;W, Hours/day; (average)													
13.	Fan:	<input type="checkbox"/> No <input type="checkbox"/> Yes, Input Power;W, Hours/day; (average)													

Respondent

Surveyor

Field Coordinator

(.....)

(.....)





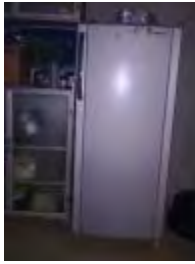





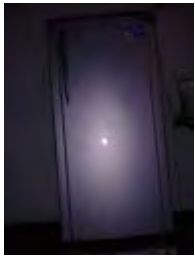




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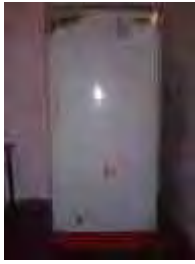





添付 2-3 : 主な家電商品の普及率



添付 2-4 : 調査対象施設







A.1 Profile of Survey 20 Houses

No	House Owner (PLN Contract)	Photo of House	Photo of Appliances		
			Refrigerator	Television	AC
1	I***** (450VA)				None--
2	S***** (450VA)				None --
3	A***** (450VA)				None --
4	N***** (450VA)				None --
5	S***** (450VA)				None --

No	House Owner (PLN Contract)	Photo of House	Photo of Appliances		
			Refrigerator	Television	AC
6	D***** (450VA)				None --
7	N***** (450VA)				None --
8	N***** (450VA)				None --
9	S***** (450VA)			 	None --
10	M***** (450VA)			 	None --

No	House Owner (PLN Contract)	Photo of House	Photo of Appliances		
			Refrigerator	Television	AC
11	E***** (900VA)				None --
12	D***** (900VA)				None --
13	Y***** (900VA)				None --
14	S***** (900VA)			  	
15	A***** (1300VA)				

No	House Owner (PLN Contract)	Photo of House	Photo of Appliances		
			Refrigerator	Television	AC
16	C***** (1300VA)				
17	B***** (1300VA)			  	
18	D***** (1300VA)				
19	H***** (2200VA)		 	  	 

No	House Owner (PLN Contract)	Photo of House	Photo of Appliances		
			Refrigerator	Television	AC
20	H***** (2200VA)			 	 

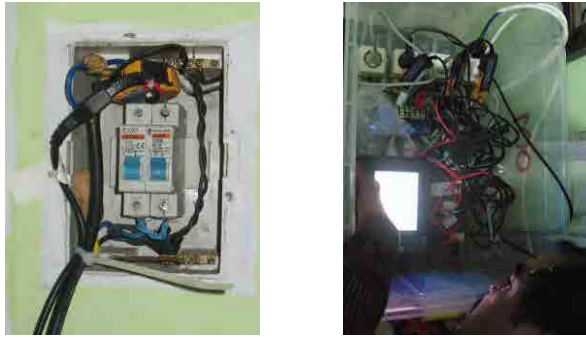

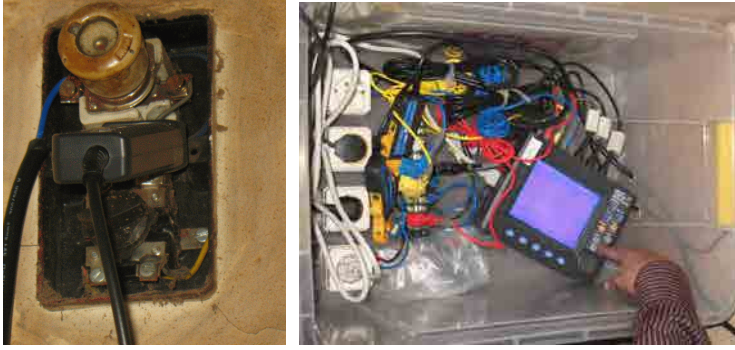
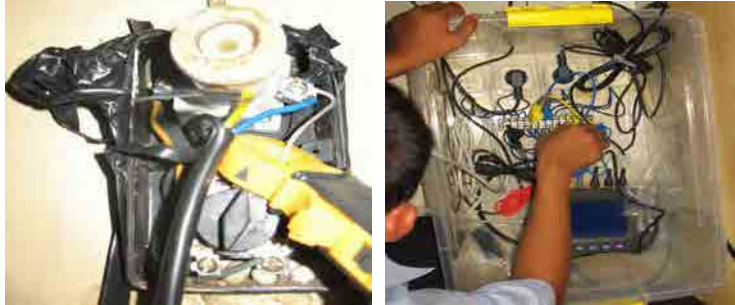
A.2 Current Limiter of House


















A.3 Measurement Devices

No	Date of measurement House Owner (PLN Contract)	Location	Photos
1	06-14/07/2011 Sudirman (900 Watt)	Komplek Batan	
2	06-14/07/2011 Ismail (450 Watt)	Desa Kerangan	
3	06-14/07/2011 Asmin (450 Watt)	Desa Kerangan	
4	06-14/07/2011 Suwarno (450 Watt)	Desa Kerangan	

No	Date of measurement House Owner (PLN Contract)	Location	Photos	
5	06-14/07/2011 Soleh (450 Watt)	Desa Kerangan		
6	14-22/07/2011 Sardian (450 Watt)	Desa Kerangan		
7	14-22/07/2011 Dahlan (450 Watt)	Desa Kerangan		
8	14-22/07/2011 Nurhafi (450 Watt)	Desa Kerangan		
9	14-22/07/2011 Diding (900 Watt)	Kompleks Perumahan Puspipstek		

No	Date of measurement House Owner (PLN Contract)	Location	Photos
10	14-22/07/2011 Hariyanto (2200 Watt)	Kompleks Perumahan Puspiptek	

添付 2-5 : 調査対象住宅における所有家電の詳細

No	Power Contract (VA)	Load Type			
		TV	Refrigerator	AC	Others
1	450	21", 21" / 80W,88W	Sanyo/ 65W	No	Lamps,vwell water pump/125W, iron /300W, washing machine/199W, rice cooker/350 W, Fan/65W
		14.6%	19.4%		69%%
2	450	21" (Polytron) / 80W	Samsung/ 65W	No	Lamps, well water pump/125W, iron /350W, fan / 45W, rice cooker 350W.
		15%	18%		67%
3	450	21" (Sanyo) / 80W	Sanyo/65W	No	Lamps, well water pump/125W, iron /300W, fan / 65W, rice cooker 350W
		4.3%	21.1%		74.6%
4	450	21" (Samsung) / 80W	Toshiba / 50W	No	Lamps, well water pump/125W, iron 300W, fan 45W, rice cooker 350W.
		4%	26.4%		69.6%
5	450	21" (Polytron) / 80W	Sanyo/65W	No	Lamps, well water pump/125W, iron /300W, fan/45W, rice cooker 350W.
		12%	27.8%		60.2%
6	450	21" (Polytron) / 80W	Samsung/115 W	No	Lamps, well water pump/125W, iron /300W, fan/45W, rice cooker 350W
		6.7%	53%		40.4%
7	450	21" (Polytron) / 80W	Sanyo/65W	No	Lamps, well water pump/125W, iron /300W, fan/45W, rice cooker 350W
		31%	25%		44%
8	450	21" (Changhong) / 80W	Toshiba / 65W	No	Lamps, well water pump/125W, iron /300W, fan/45W, rice cooker 350W
		17.1%	25.3%		57.5%
9	450	21" (Samsung) / 80W	Asatron / 115W	No	Lamps, well water pump/125W, iron /300W, fan/45W, rice cooker 350W
		11%	43.9%		45.1%
10	450	21" (Fujitec) / 80W	*Cooler / 210W	No	Lamps, well water pump/125W, iron /300W, fan/45W, rice cooker 350W
		26.5%	43.1%		30.4%
11	900	21" (Samsung) / 80W	Sharp / 100W	No	Lamps, iron /350W, rice cooker 350W,washing machine100W,Dispenser 420W, fan/50W
		7.2%	13.9%		78.9%
12	900	21" (Panasonic,Sharp) / 80W,80W	Sanyo/65W	No	Lamps, iron /300W, washing machine 100W, rice cooker 350 W, dispenser 350W,Computer 400W,Fan1 10W/ Fan2 10W
		15%	18%		67%

No	Power Contract (VA)	Load Type			
		TV	Refrigerator	AC	Others
13	900	21" (Ichiko) / 80W	LG / 115W	No	Lamps, Dispenser 450W, and iron /350W, washing machine 100W, rice cooker 450 W.,fan 75W
		8.8%	17.9%		73.2%
14	900	21",21",14" (Sony,Sanyo , Sanken) / 80W, 80W, 56W	LG / 115W	LG,1/2 pk /320W	Lamps, and iron /300W, washing machine 220W, rice cooker 350 W, fan 8W
		16%	18%	30%	36%
15	1300	29" (Sanken) 90W	Sharp / 135W	LG, 1/2 pk /350W	Lamps, washing machine 100W, rice cooker 450 W,Dispenser 300W ,iron /350W, fan 50W
		14%	18%	9%	59%
16	1300	21" (Toshiba) 80W	National / 115W	1/2 pk/ 350W	Lamps, well water pump/125W, rice cooker 350W,washing machine 200W,iron /300W, fan 75/W,
		7%	19%	43%	31%
17	1300	21" (Sanyo) / 80W	Panasonic / 105	3/4 pk /640W	Lamps,well water pump/125W, and iron /300W, washing machine 200W, rice cooker 350 W, ,Computer, Fan 30W.
		15%	15%	47%	23%
18	1300	21" (Sanken) / 80W	Sharp / 115W	1/2 pk /350W	Lamps,well water pump/450W, iron /300W, fan/75W, rice cooker 350W,washing machine 200W
		8%	32%	29%	31%
19	2200	14",21",29" (Samsung),, 60W/80W80 W	Panasonic / 125,110W	Panasonic, LG, Sharp 0.75pk,0.5pk, 0.5pk	Lamps,iron /300W, washing machine 200W, rice cooker 350 W, fan 16W,Dispenser 300W,Oven 200W/ Microwave 980 W ,well water pump/125W,Computer 400W,Water Heater 500W.
		3%	15%	32%	50%
20	2200	21",29" (Samsung,L G) / 80W,60W	Toshiba /70 W	1/2pk,1/2pk /350W,350 W	Lamps, and iron /300W, washing machine 200W, rice cooker 350 W, fan 75W, Toaster 300W , Computer
		6%	19%	8%	67%