

# **Development of Energy Labelling in Malaysia; Past, Present and Future**

by

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## **Introduction**

Malaysia is currently a net exporter of energy. In 2001, the country registered a total net export of 26,311 KTOE. The largest export were LNG, followed by crude oil. The country however is a net importer of coal (mostly to meet the need of electricity generation). In the not so distant future (as near as 2008) Malaysia will be a net importer of oil products, and the nation will have to face the economic consequences of this, including the issue of security of energy supply from foreign resources. The Malaysian Government has taken steps to meet this new challenge in the energy sector by promoting renewable energy (RE) and energy efficiency (EE). One of the EE options currently being developed is the promotion of energy efficient appliances. For industrial sector labeling program for motor is currently being developed. For domestic sector, energy efficient refrigerators have been chosen as the first contender for the promotion. This paper will only discuss the development of energy labeling in the domestic sector.

## **Status of Energy Consumption in Malaysia**

### *Energy Trends, 1980 - 2001*

Table 1 shows the trend of final energy used by sectors from 1980 to 2001. In 2001, the final energy demand of Malaysia stood at 31,515 KTOE while the primary commercial energy supply was 50,450 KTOE. Petroleum products were the dominant fuel in the final use of commercial energy accounting for about 65%. The share of electricity was 18%.

Malaysia's energy demand was dominated by two largest consumers i.e. the transportation and industrial sectors. The sectors together consumed almost 80% of total final energy demand in the country in 2001. The industrial sector share in the overall energy consumption declined from about 45% in 1980 to 38% in 2001. For the transport sector, its share had increased from 38% in 1980 to 42% in 2001. Over the period 1980—2001, energy demand of the industrial sector grew at an average of 6.9% per annum due to the rapid industrialisation process taken place in the country. At the same time, energy consumption in the transport sector grew at 8.4% per annum, mainly due to the increase in population as well as income per capita. However it is interesting to note that the combined share of commercial and residential sectors was at about 13% for the past two decades.

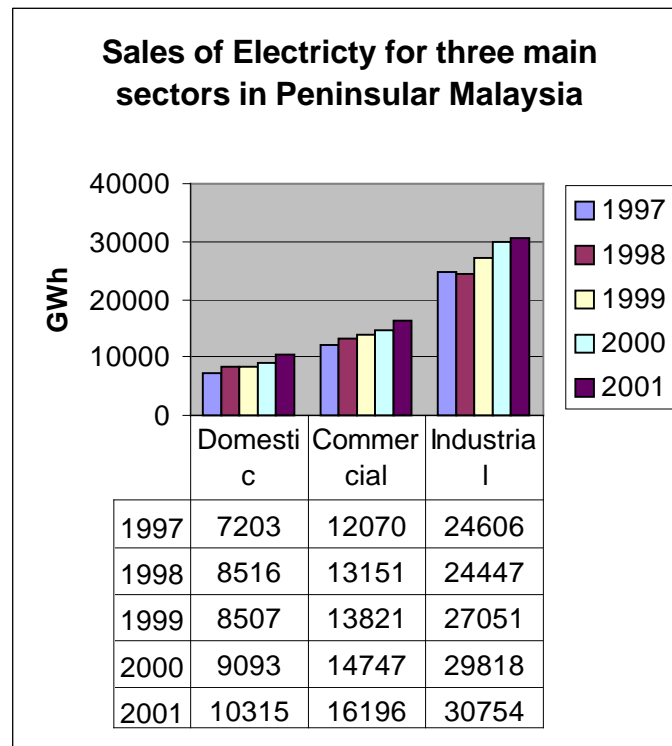
**Table 1: Final Energy Demand by Sector, 1980-2001 (KTOE)**

<b>Sector</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>2001</b>	<b>P.A. Growth 1980-2001</b>
Industrial	2870	3726	5885	8060	11852	6.9%
Transport	2398	3477	5387	7827	13137	8.4%
Residential/ Commercial	826	1123	1646	2837	4048	7.8%
Others	291	386	299	2994	2378	10.5%
Agriculture	n.a.	n.a	n.a	446	98	n.a.
<b>Total</b>	<b>6385</b>	<b>8712</b>	<b>13217</b>	<b>22164</b>	<b>31515</b>	<b>7.9%</b>
<b>% share</b>						
Industrial	44.9%	42.8%	44.5%	36.4%	37.6%	
Transport	37.6%	39.9%	40.8%	35.3%	41.7%	
Residential/ Commercial	12.9%	12.9%	12.5%	12.8%	12.8%	
Others	4.6%	4.4%	2.3%	13.5%	7.5%	
Agriculture	0.0%	0.0%	0.0%	2.0%	0.3%	

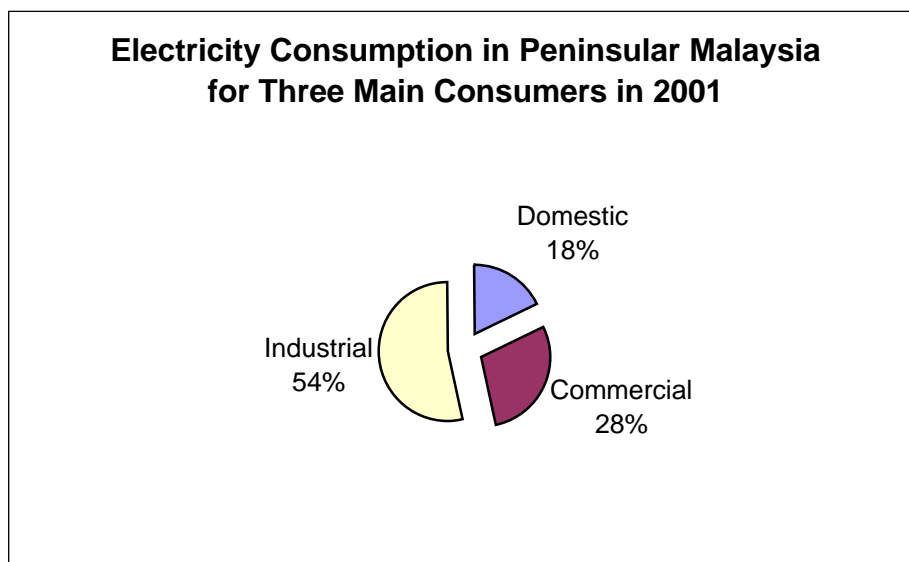
*Source: National Energy Balance, Malaysia 1980-2001*

### *Electricity Demand and Supply*

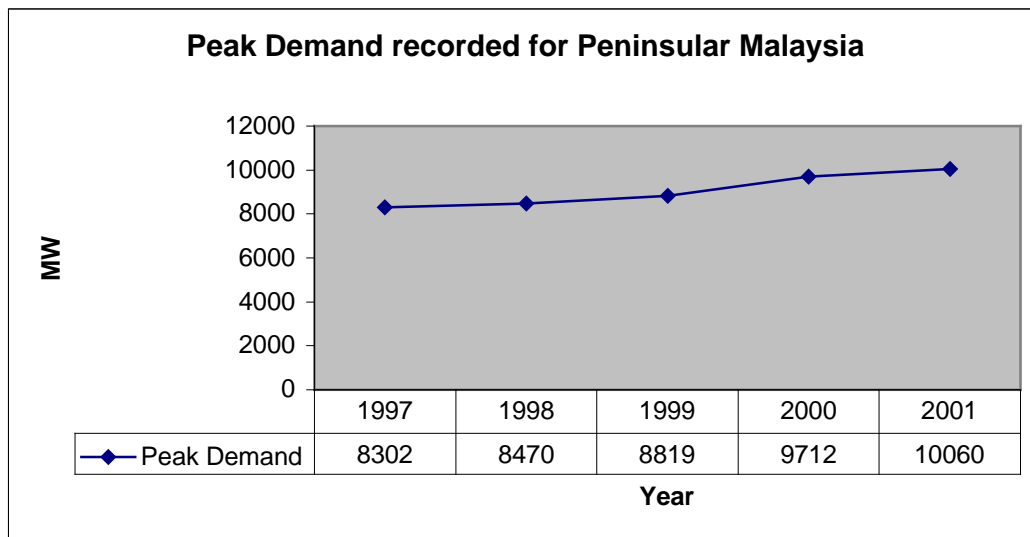
Electricity demand for three main sectors is given in Figure 1. Industrial sector has always been the biggest user of electricity. In 2001 the sector consumed about 53% of electricity generated in Peninsular Malaysia. Residential and commercial consumed 46% (18% Residential and 28% Commercial), while public lighting, mining and other sectors consumed about 1%. Peak demand in Peninsular Malaysia alone has grown from 3447 Megawatts in 1990 to 9712 Megawatts in 2000 and 10,060 Megawatts in 2001. This is projected to grow by more than 117 percent to 21668 Megawatts in the year 2010. In 2001, 76% of the electricity was generated using gas, 9% using coal, and 8% from Hydro power.



*Figure 1*



*Figure 2*

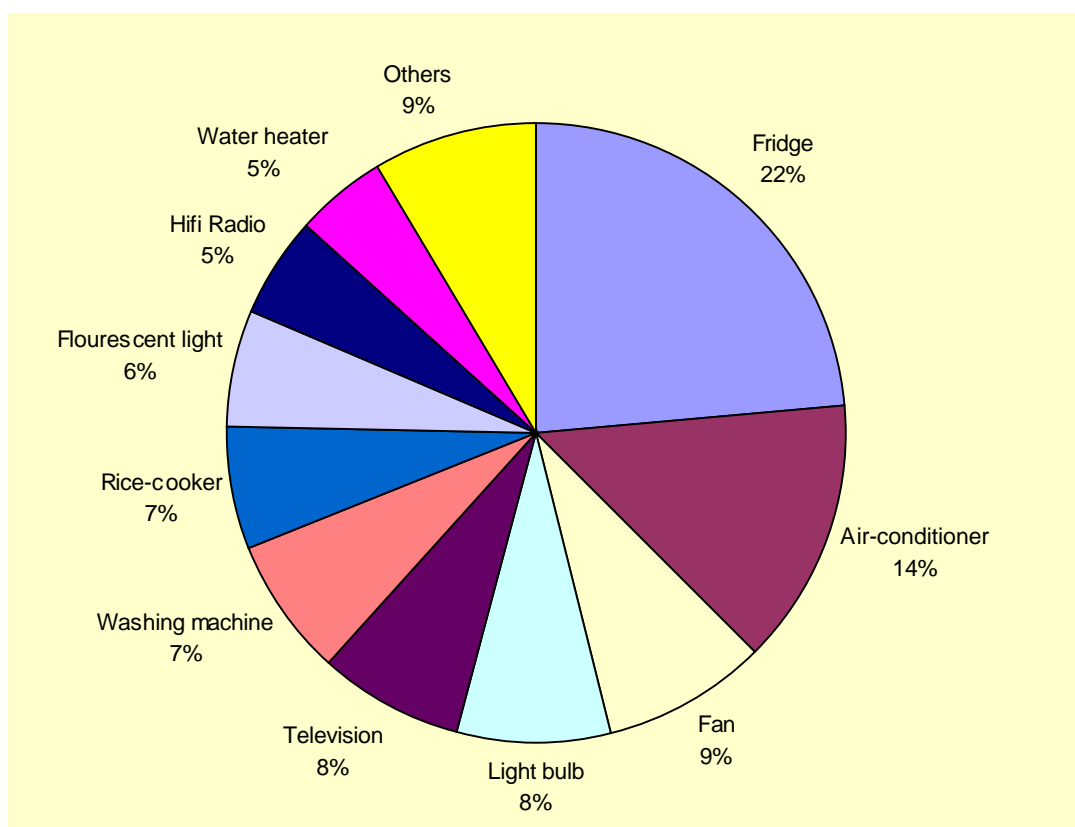


*Figure 3*

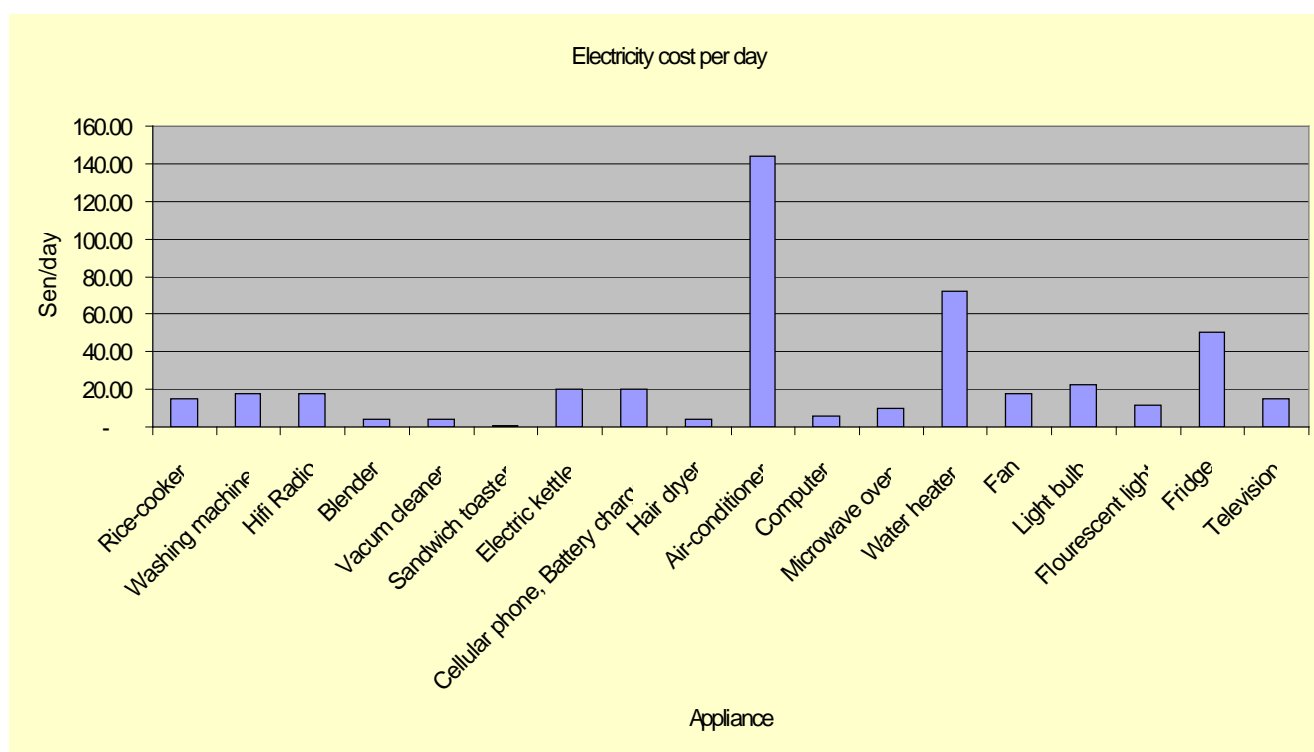
#### *Electricity Consumption in Domestic Sector*

In residential or domestic sector, electricity demand is driven by the growing number of households and as well as the development in household income distribution. A study in 1998 estimated that an average family in low cost house spends about RM 65 (about US\$17) per month, while the electricity in the medium cost house is approximately RM 110 (US\$30) per month, and in a bungalow can go up to RM 350 (US\$92) per month. The electricity consumption per household depends very much on family size, living habits, number and age of electrical appliances and their hour of use. Wise use of electricity, as well as the use of efficient appliances will reduce energy, hence the electricity bills.

The average energy used by various appliances and their daily costs are given in Figures 4 and 5.



**Figure 4: Energy Uses in residential Sector**



**Figure 5: Estimated daily electricity cost per day of various domestic appliances**

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## The Development of Appliance Energy Labelling

### *The Past*

Energy labeling for appliances in Malaysia began when the Directorate General of Electricity and Gas (Jabatan Bekalan Elektrik dan Gas, JBEG), predecessor of the Energy Commission (Suruhanjaya Tenaga, ST) requested Standard and Research Institute Malaysia (SIRIM) to initiate a formation of a working group under Industrial Standard Committee - Group E (ISCE). The purpose of this working group was to develop “Energy Efficiency Standards” for three products, namely fans, refrigerators and air-conditioners.

The working group was later upgraded to Technical Committee on Performance of Households and Similar Electrical Appliances (TCPHEA) with the mandate not only to develop the energy efficiency standards for the three products but also to look into the development of performance standards of other appliances.

TCPHEA decided that two Malaysian Standards (MS) would be developed for each appliance:

- Ø Energy Performance Testing Standards: Testing standards that specify protocols for testing the performance of products and equipment imported, produced and sold in Malaysia. The standards specify procedures for testing the energy performance of appliance and energy-using equipment.
- Ø Energy Efficiency Labeling Standards: labeling standards specify a label design, rules for label application, criteria for categorizing appliance and energy using equipment based on energy performance.

The performance testing standards can either be adopt or adapt whenever possible the international testing standards for the equipment, such as from the ISO and the IEC standards. Energy Efficiency Labeling Standards however require more attention and work.

By September 2002, SIRIM issued a “Draft Malaysian Standard (02E003R0) for Public Comment: Energy Labeling for Electric fan”. The draft standard includes a label design, rules for label application, and criteria for categorizing fans based on energy performance testing. TCPHEA has also been pursuing similar work in parallel for refrigerators.

With the creation and mandate of the newly formed Suruhanjaya Tenaga (ST), it has been decided to transfer the TCPHEA work and output on energy efficiency labeling to a new End Use Energy Rating Work Group (ERWG).

### *Current Development — The New Framework*

Under the new arrangement, roles of institutions in the development of energy-efficiency regulations and programs affecting appliances and end-use equipments are clearly defined as shown in Figure 6. The development of energy performance testing, energy labeling and minimum energy performance standards, have been properly charted.

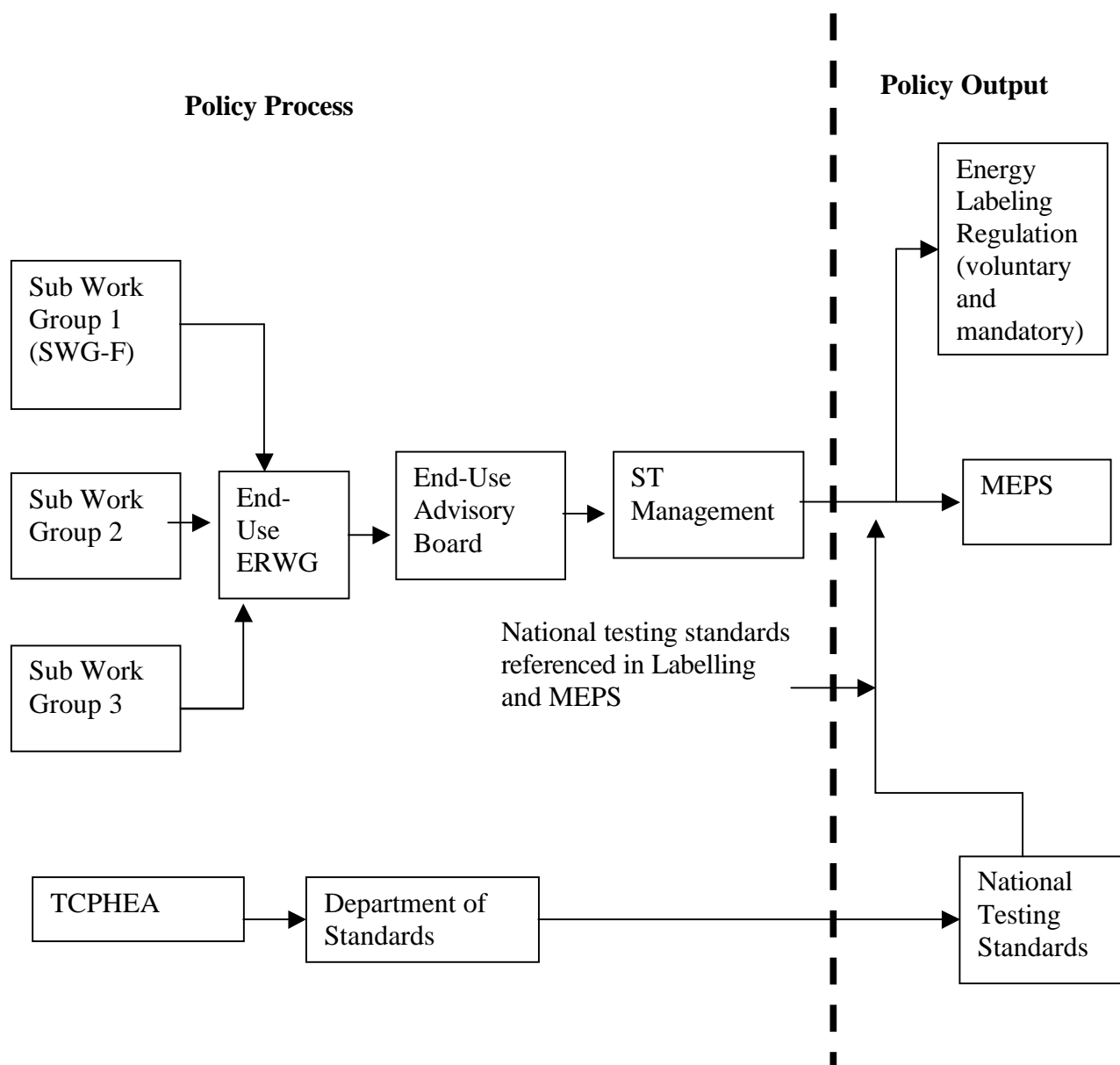
The basic roles corresponding to the diagram in Figure 6 is explain below:

**ST** is responsible for issuing directives for energy efficiency labeling of energy using products. ST has the authority to issue directives to set MEPS for the energy-using equipment. The End-Use ERWG and its Sub-Work Groups play a critical role in advising ST on technical contents, technical and policy aspects of the design and implementation of energy labeling and MEPS.

The objectives of the End-Use ERWG as stated in its Term of Reference is “to develop and propose policies for energy rating programs for end-use appliances including labeling and

minimum energy performance (MEPS) and coordinate the implementation of programs and mechanisms to promote public awareness of energy-efficient appliances in the sector”.

**Department of Standards (TCPHEA)** is responsible to the establishment and maintenance of testing standards for the appliances and energy using equipments that will be affected by the energy labeling and MEPS directives. As shown in Figure 6, each of the ST directives must reference a Malaysian Standard for testing the energy performance.



**Figure 6: Roles of institutions in developments of testing standards, energy labeling regulations, and MEPS in Malaysia**

#### *End-Use ERWG current activities*

- Ø Implementation of Voluntary comparative and endorsement labelling.

The ERWG has chosen to build upon the previously initiated TCPHEA proposal for an appliance labelling scheme (comparative labelling for ranking of refrigerators) to

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provide appliance buyers an opportunity to choose the more EE options of appliances based on the impact of energy cost on the total cost of ownership of the appliances concerned.

The ERWG also proposes to employ the option of an “endorsement label” to supplement the comparative rating labels to further encourage the use of the most energy efficient options of appliances available for sale in Malaysia.

The ERWG considers it is essential that the above strategies be supplemented with dedicated and comprehensive advertising and promotion campaigns to increase public awareness of the benefits of the EE appliance strategies, especially for the domestic type of refrigerators in order to increase the market share of the efficient units.

Ø Formation of Sub-Work Group for Refrigerators (SWG-F)

Based on a study conducted by ST, it is decided that energy labelling and promotion campaign should start with refrigerators. Thus a sub-work group (i.e. for refrigerators, SWG-F) was established.

The main task of SWG-F is to define the necessary parameters for assessing and ranking of refrigerators according to their energy use performance has been established. To this end, manufacturers, importers and dealers, as well as consumer groups and relevant NGOs in Malaysia have been recruited as key stakeholders into the work group.

The work group has collected information of refrigerators available in the market. Using this information, market share of the refrigerators in terms of brands, sizes and doors has been identified. Further extensive market survey to investigate market preference and awareness are currently being undertaken. The information gathered will be useful in the designing of awareness and promotion campaign.

The work group also has managed to persuade the manufacturers, importers and dealers of refrigerators to develop a voluntary agreement to promote the manufacturing, import and sale of the more energy efficient refrigerators and to attempt to phase out the availability of the less efficient units. A Memorandum of Understanding on Promotion of Energy Efficient Refrigerators (MUPEER) will take place on 4th December 2003. Five manufactures and importers of refrigerators will take part in the signing ceremony. These five signatories covered about 80% of the refrigerators sold in the market.

For the development of Technical data and Energy Efficiency ratings, SWG-F will conduct performance tests on 20 refrigerators available in the market. The refrigerators will be tested using MS ISO: 8561, Characteristics and Test methods for Household frost-free refrigerating appliances- refrigerators, refrigerator-freezers, frozen food storage cabinets and food freezers cooled by internal forced air circulation (ISO 8561).

Ø Data from these tests will be used to develop the EE ratings.

Ø Market survey on EE labels and purchasing criteria

Energy-efficiency labels are informative labels that are affixed to manufactured products and describe a product’s energy performance (usually in the form of energy use, efficiency, or energy cost) to provide consumers with the data necessary for making informed, economically sound purchases.

Labels also provide a common energy-efficiency benchmark that makes it easier for utility companies and government energy-conservation agencies to offer consumers incentives to buy energy-efficient products. The effectiveness of energy labels is highly dependent on how they present information to the consumer.



A market survey to identify the labels consumers tend to prefer and how they respond to the comparative and endorsement labels need and has been initiated. A preliminary survey on a focus group of 15 people representing NGOs, manufacturers, importers and government officers has been conducted. The survey identified the preferred labels as label E in Figure 7 (for endorsement), and the star rating in the case of comparative labelling (see Figure 8).

The purchasing criteria is very much determine by

- prices,
- design, and
- features.

The proper market survey will commence soon and is expected to complete with the finalized labels design by February 2004.



*Figure 7: Labels for Endorsement Labelling*



Figure 8: Labels for Comparative Labelling

## The Future

- Ø Labelling, awareness and promotion of energy efficient refrigerators

It is hoped that this can be achieved before the middle of 2004. Once the labels have been identified, and testing of the 20 refrigerators completed, grading based on efficiency can be established.

In the mean time details of awareness and promotion programs can be properly drawn.

- Ø Labelling of Fans

A task force to look into this has been established recently. The task force will take on and complete the task of developing regulations on energy labeling for fans initiated

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by TCPHEA. Although a proper promotional campaign may not be possible, it is believed that once the energy labels for refrigerators are accepted, interest to buy efficient appliances would be greatly increased.

Ø ASEAN Regional Energy Labeling Program

The End-User ERWG hoped to extend the labeling program to cover more appliances. The group also take into account and support the ASEAN Regional Energy Labeling Program. Program activities are currently being drawn to cater for this, not only to ensure the success of these regional initiatives but also to make certain Malaysian manufactures are at par with manufactures in the region and can produce high efficient products.

### **Conclusions**

In developing the energy labeling program, we have referred and learned from the many success stories of other countries. The mode of operandi was changed as and when it is needed. We have progressed thus far, and are looking forward to see the first refrigerator with energy label in the market very soon.

### **Reference**

Statistics of Electricity Supply Industry, Year 2002 Edition, Suruhanjaya Tenaga

National Energy Balance Malaysia 2001

Your Guide to energy efficiency at home CETREE, June 2002