MANUFACTURER'S PERSPECTIVES ON ENERGY EFFICIENCY STANDARDS AND LABELLING

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INTRODUCTION

Demand Side Management Project is a mission that the government assigned to the Electricity Generating Authority of Thailand (EGAT) to promote the efficient use of electricity in Thailand or in other word how to use electricity in the most saving and cost-effective manner. It is expected that with the achievement of this mission, it would help reducing the investment cost for new electricity power plant, which will directly benefit the general public in terms of relieving their payment on electricity and reducing the impact towards ecology system.

However, the economic development, the expansion of the industry and the increasing in size of community, are the causes of the increasing in electricity use as well. Therefore, the project "Let's join hands to save electricity" has been initiated since it would be impossible for the government alone to do the campaign, it needs participation and concerted cooperation from all Thai people to help promoting the efficient use of electricity.

Because of the increase in electricity use annually, EGAT has to take responsibility in procuring more electricity power to serve the people, either by buying from the neighboring countries or by producing on its own, whichever mean they choose, there are problems for example, problem of the limited sources of power like water power, coal power, and fuel oil.

For water power, the irrigation dam has to be built in order to retain water. Forest and mountain will be under water, wildlife and native people used to live in upper area of the dam have to migrate form their homeland. This is the lost that could not be estimated. We do not know how long does it take for these people to get used to their new land, new environment, and their new social like. Who can tell their life will be better or worst?

Moreover, we all know that electricity power plant from coal would produce sulphur-dioxide, which effect the environment and health of the people who live around the plant leading to resistance form the local community. To make them understand and to convince them sometimes takes more than 10 years.

The project "Let's join hands to save electricity" has been put on started on December 3, 1991.

As September 20, 1993 is the 109th anniversary of the use of the first light bulb in Thailand, we have taken that opportunity to declare open the campaign on " Let's join hands to save electricity by use the new thin style light bulb" . This new thin style light bulb can save 10% of electricity more than the old light bulb style. Then, not long after that, EGAT invited 5 major refrigerator manufacturers in Thailand i.e. Mitsubishi, National, Toshiba, Sanyo and Hitachi for discussion and brainstorming of the new campaign on energy saving refrigerator.

The reason for EGAT to choose refrigerator for the campaign after the light bulb because each year the sale volume of refrigerators in Thailand are more than 1 million units. Details are as follow:

1. The proportion of refrigerator sale of one-door model is about 85% and two door model is about 15%
2. The proportion of refrigerator sale of one-door model are as follow:
   2.1. Size 6 cubic-foot (170-180 liter) with the highest sale of 60-65%.
   2.2. Size 4 cubic-foot (120-130 liter) with the highest sale of 20%.

2.3. Size 2 cubic-foot (60-70 liter) has uncertainty sale volume based on business condition of the hotel and real estate with the proportion of 5%.
2.4. The other sizes such as 5 cubic-foot (140-155 liter), size 7 cubic-foot (190-200 liter), and larger than 8 cubic-foot (230-250 liter) together they has the sale proportion of 10%.

3. The consumption refrigerator product increased 10% annually.

Therefore, EGAT and the representatives from the refrigerator producer started to use the energy saving label with the one-door model refrigerator (size 6 cubic-foot) because this model made the largest sale volume in the countries. As 5-refrigerator manufacturers produced this type of refrigerator; it is therefore a quite smooth negotiation in terms of measurement standard of efficiency. Thailand Industrial Standard Institute, or TISI Was assigned to serve as the government focal point to test power use and capacity of refrigerator to calculate the efficiency of refrigerator.

On September 20, 1994, it was the first day that the energy saving label was put on refrigerator. There were 14 models on refrigerators being tested, but only one model was awarded the highest energy saving standard of level 5.

In 1996, the refrigerators' producers were more ready, EGAT extended the project to cover every model of refrigerator in one-door model. In the same year, EGAT started to expand this campaign to other refrigerator model in the market, which include two-door model and more than two-door model as well as to cover all brands available in the market.

In 1997, EGAT issued the Act on Energy Saving Label for every one- door model in the market.

In 1998, EGAT required that two-door model refrigerator have the energy saving label for the first time.

For the year 2000, EGAT has adjusted energy saving up to 20% because it has been 6 years then that all refrigerators received the energy saving label of level 5; therefore, they deem it is time to upgrade it. This new energy saving label was effective on 1 January 2001 and to let the people know that the refrigerator has received new standard, the energy saving label for the refrigerator are made distinguish with the figures of the year 2001 on the label.
The result of this project is that from the 20th of September 1996 to the 30th of June 2000, 5,462,282 refrigerators are certified with the energy saving label. This means that we can save as much as 73 megawatt of electricity or 533 million units of electricity consumption.

The next in line of electrical appliances to be promoted in the campaign is air-conditioner as it is one of the home appliances with high growth rate, and it is the product which consumes highest electricity power in household and building. Again, the manufacturer and the air-conditioner importer have provided good cooperation in sending their products for testing the efficiency of energy saving.

The result of the project from the 20th of September 1995 to the 30th of June 2000, showed that it can reduce the highest demand of electricity consumption of 45 Megawatt or 680 million units of energy consumption.

Besides, EGAT has expanded its project to cover ballast and hand- polished rice because the later can save energy more than 60% if it is not being transformed into white rice and most importantly it can maintain its nutrients.

EFFORTS AND ACHIEVEMENTS

To upgrade the quality and efficiency of a product always mean an increase in cost of production which includes cost for product design or cost for materials for example, the refrigerator, the design of cooling system needs to be more efficient, the cost of other materials such as Compressor, CFC, Poli-urifome or

even the higher length of copper tube. These are all the costs that the manufacturer have to bear and could not throw to the consumer due to the marketing mechanism and social responsibility.

In the joint efforts between EGAT and the refrigerator manufacturers since 1992 to determine the standard of efficiency. The foreign energy saving label samples were used for analyzing the suitable efficiency standard for Thai products.

In the early stage of collaboration between EGAT, TISI, and the refrigerator manufacturer. TISI which was assigned to serve as the central body for testing, determined the technical testing method for example, determining the temperature within the refrigerator, the duration for test, load or no load with the food, error used to test to calculate the output of energy consuming. Other than those mentioned, the measurement of the size of the refrigerator were determined by using "water" to caluclate the volume.

Once the energy consuming point and the size of the refrigerator have been identified, the efficiency of each testing refrigerator will be calculated, then, the refrigerator of 5 companies will be measured or tested to identify mean which is call x and the energy saving label are determined as follows :
Begin the test with the 6 cubic foot refrigerator (170 – 180 liters)
Label level 1 means the efficiency is 25% less than $\bar{x}$
Label level 2 means the efficiency is 15% less than x but not exceed 25%
Label level 3 means the efficiency 15% less than x but more than $\bar{x}$ and not exceed 10%
Label level 4 means the efficiency is 10% more than x but not exceed 20%
Label level 5 means the efficiency is 20% less than $\bar{x}$

This means that most refrigerators tested in 1993 was given energy saving label level 3. Anyway, in order to get label level 5, label refrigerators need to add more than 20% of efficiency. However, it is not easy to develop such quality in a few months times, obviously some companies may take 1-2 years to accomplish this but some may take more than that.

However, the social responsibility and the marketing mechanism have forced each manufacturer to develop label level 5 label refrigerator as soon as possible otherwise it will become disadvantage of the company, in term of quality and efficiency. Moreover, it will also affect the customer's confidence towards the company.

In 1995, the Montreal Treaty forbidding the use of CFC in refrigerator as it affects the Ozone layer, was ratified and would be effective on January 1, 1996. Both cooling chemical substance and mixed chemical within preventive insulation are banned, only Non-CRC or HFC can be used instead. These two substances have been known in their inferior efficiency in cool generating and cool leakage prevention. Besides in term of price, it is more expensive comparing with CFC.

Therefore any models of refrigerator produced for sale in 1996 had to be more developed in term of energy saving that that on sale in 1995. The cost was slightly increased but the huge benefit on Green House Affect prevention has been more valuable that the increased cost that we paid.

In 2000, it was agreed that the standard value be increased by 20% of or an increase of x to 20%. The former criterion comparing energy saving label of level 4 and label of level 5 still be used for calculation new standard for 2001. As mentioned earlier, in 1994 – 1996, it was already and effort to change from energy saving label level 3 to level 5 and in 2000, the increasing of 20% meant another tough work for refrigerator manufacturers.

Certainly, the development has its own limitation, unless there is an innovation for the frog-leap development. The same case can be applied for refrigerator manufacturing, its design is limited in efficiency development unless the compressor, which is the core part, is developed as well. Since the compressor procedures are not involved in the first stage thus EGAT requested the compressor producers in Thailand which have only a few to produce energy saving compressor which normally

consumes up to 80% of energy, the energy saving compressor would be more helpful both in efficiency and energy saving.

Moreover EGAT has launched continuous campaign through advertisement, public relations and exhibition on the efficient use of electricity.

The success of these particular project dose not lie only on EGAT's performance or related agencies but also the cooperation of all people in Thailand. Everyone becomes more aware of the problems that the world is currently facing, for example water and air pollution, Green House Affect, energy shortage, limited energy resources, etc. We need to do more to build the correct understanding to our people so that they understand and be aware of those facts. Then the campaign for efficient use of energy will not beyond our efforts. Some of the slogan used in the campaign are such as "Turn off the Light every time after use" or "Turn on the Light only Necessary" or "Use only the Energy Saving appliances"