

## Efficient electrical home appliance supply chain for low income household in Thailand

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### Abstract:

Energy efficient (EE) household appliances are considered as one of important players to reduce energy consumption in the residential sector. Price and accessibility of EE appliances are still a crucial concern for low income household in Thailand. While there are several energy efficiency policies for producers and end-users, only few policies for retailers and wholesalers have been implemented in Thailand. A gap of EE distribution to low income household can partially be caused because of a lack of EE policy addressing the supply chain. Energy efficiency policy could focus more on retailer and wholesaler shops by introducing financial support and knowledge training. Providing business network and simplified information on EE to retailers could also help spreading out the benefit of using EE products directly to end-users. Policy integration of enforcement Minimum Energy Performance (MEP) and Standard Offer Program (SOP) for retailers and wholesalers could contribute to the EE supply chain improvement in the future.

**Keywords:** low income; energy efficiency; EE; MEP

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## 1. Introduction

Energy efficiency is one of key drivers for the sustainable energy development. Energy labels can be a tool to indicate the high energy efficient products as well as raise consumer behavior awareness. However, the price of those appliances with high energy efficient label can often be more expensive than traditional technology. In Thailand, the "Energy label 5" was introduced already in the year 1991 for products that meet a certain standard of efficiency. Today, "Energy label 5" is already available for 23 product types. In some cases, it may be argued if the energy efficiency standards are tightened often enough, e.g. for product types where all brands available in the market are receiving the "Energy label 5". Generally, most of high-energy consumption products always have energy label e.g. air conditioning, washing machine, refrigerator and water heater. This is because customers emphasize more on electricity bill even the high initial cost is quite more expensive than non-energy label products. However, low-income households still face additional challenges buying energy efficient products because of higher upfront capital costs and limited financial resources.

Several EE policies have been targeted on producers and end-users to reduce energy intensity. However, there seem to be lack of policies for key players along the supply chain between the EE producer and customers which are retailer and wholesaler shops. Although energy labels have been implemented in Thailand for over 20 years, many retailer shops still sell traditional technology products over EE ones. Therefore, this study aims to analyze and identify market barriers and key drivers throughout the supply chain for selling EE products in Thailand. The results can help to identify the root causes as well as provide policy recommendations for EE products supply chain in Thailand.

## 2. Electric appliance market scheme

### 2.1 Energy Efficiency label in Thailand

Label No. 5" is defined as the label indicating energy efficient electric appliances in Thailand. This label scheme is managed by the Electricity Generating Authority of Thailand (EGAT) since 1991 (EGAT, 2014). Thailand has been implementing "Label no. 5" on twenty electric appliances. The initial

idea of the label was to rank the energy efficiency of electric appliances by numbers of the label varying from #1 to #5, where the higher number indicates higher energy efficiency. The label also shows the average energy consumption per year (kWh/year) and the average electricity price per year (Baht/year) which help customers to differentiate the quality and cost effectiveness of products in the market.

At the present, there is only #5 label in the market. This is because the labeling scheme is a voluntary scheme, causing producers only to use the label if they can indicate the highest level of efficiency, the number #5 (EGAT, 2014). As a result, customers have only a reference to differentiate between EE products with #5 and non EE products.

## 2.2 Distribution and supply chain EE products

Generally, EE producers can be classified into three categories; foreign ownership, joint venture, and Thai ownership (MoI, 2013). These producers have a similar product supply chain to customers through either their own suppliers or the wholesalers and retailers as shown in Figure 1. As of 2013, there are 582 electric appliances producers in Thailand but it is only 33% who have EE products in their company (EGAT, 2014; MoI, 2013).

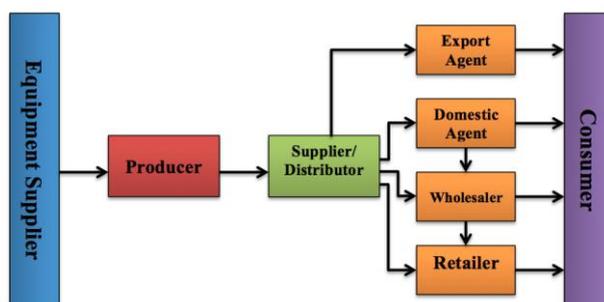


Fig. 1 Distribution scheme of electric appliance producer in Thailand.

As a result, non EE appliances take the market share over the EE ones especially the import products from China. Some well-known producers have both energy efficient and non EE products in order to have electric appliance products available for every income level. Retailer shops have many choices to choose products with the maximum benefit. However, medium and small retailer shops are not likely to have negotiation potential and investment cost for stocking the higher cost EE products compared to large-scale retailer shops. Consequently, medium and small retailer shops, which are especially existing in non-urban areas, are likely to have less EE products on offer than large scale shops. This results directly to customer's accessibility for EE products especially in remote areas

## 2. Methodology

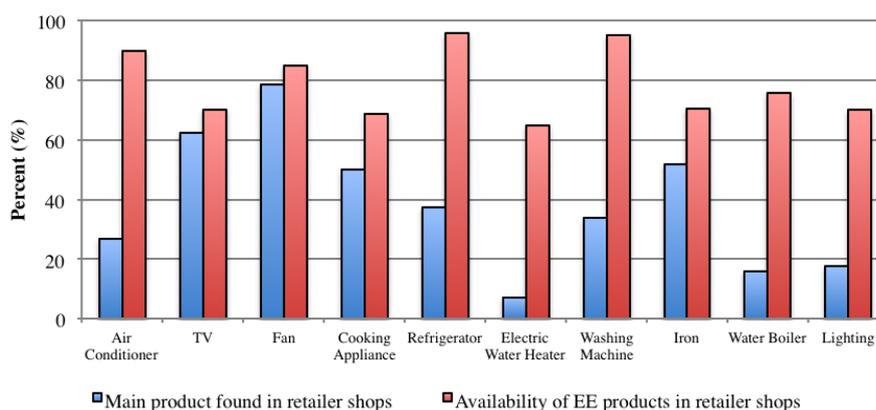
A market survey on electric appliance retailer shop was conducted for 56 samples in seven regions of Thailand. In this study, we use "SurveyMonkey" software as a tool for collecting data from the interviews. The criterion for selecting sites for the market survey is according to the household survey on energy consumption for low income household (JGSEE, 2014). This way, it helps to track the relationship between the availability of electric appliance in the market and the products used in household. The questionnaire focused on availability of EE products, staffs knowledge and skills, sales promotion and service, barriers and key driver to roll out energy efficiency technologies to low income household.

## 3. Results and discussion

Most of the retailer shops are medium and small scale, which have 2-5 products in the shops. It was

found that their main products for household are fan, cooking appliance, TV, and lamps which generally are found in retailer shops more than 50% in Figure 2. These products are used for a short time period and daily. Therefore, their electricity consumptions are likely to consume lot of energy especially for people with low income.

On the other hand, the availability of EE products for high energy consumption air-conditioning, refrigerator, washing machine, is greater than the small energy consumption products. This is because customers are more concerned of energy consumption and likely to buy more expensive products with higher energy efficiency and overlook for small energy consumption appliances that are used for long hours every day.



**Fig. 2** Main products sold and availability of EE products in retailer shops.

From the interview, it was found that EE product availability for consumers has a direct relationship with EE product accessibility of retailers. As mentioned before, small and medium sized retailer shops seem to have more difficult access to stocking EE products because of higher costs of these products and lower financial capacity of these smaller sized shops. The EE logistic management and lack of financial support could limit the accessibility of EE product for low income household in some remote areas.

### 3.2 Knowledge and skill of staffs in retailer shops

Based on the interview results, many small and medium retailer shops are family business. It was found that staff knowledge is intermediate while most of customer knowledge on EE products is good. Staff responsibilities are mainly as sellers and delivering products to customers. Some retailer shops are offering installation and maintenance services and act as a coordinator between customers and producers who actually provide such services. However, most retailers do not directly have their own department for these services.

Many retailer shops are optimistic on EE products and their potentials in the market. However, they are still in doubt whether they would like to expand their businesses in this direction because of insufficient capital for investment, and unclear profitability of the EE products compared to conventional items. A technical support or training on cost-benefit analysis to compare between products with and without energy efficiency label could help rising this confidence. This is because customers concern on the initial payment rather than the life cycle cost of appliance.

### 3.3 Key barriers and main drivers for selling EE products

According to the survey results, the retailer shops encounter difficulties accessing financial aid, information, and technical support. Encouraging technical supports from government and producers to retailers can help retailers to expand their business toward EE products,. Moreover, the retailers

have needs to differentiate themselves to strengthen their local competitiveness. Hence, policy makers can support retailers on their marketing and how they can improve their image to be more environmental friendly by developing policies to provide information on EE technology and business networking e.g. energy fair exhibition, newsletter. This could help to distribute relevant information to retailer shops and spread out EE knowledge directly to end-users. Furthermore, consumer behavior on energy consumption is one of the key barriers for selling EE products. Policy could focus on how to increase their awareness toward their daily lifestyle especially electric appliances with low energy consumption but daily use.

Registration of electric appliance retailer shops into a national system could help government for tracking and providing benefits from selling EE products to retailers. This can for example be done when developing a Standard Offer Program for this specific purpose. While there can be SOP implementation to help retailers in term of benefit and verifying, Minimum Energy Performance (MEP) should be enforced for every electric appliance to screen low quality products out of the market.

#### **4. Conclusion**

Most of EE polices in Thailand have been mainly focused on producers and end-users. Therefore, there seems to be a gap between them that results to lack of incentives for retailer and wholesalers for selling EE products. Price, accessibility and promptness of EE product are key drivers to encourage consumers using high quality products. Logistic management of EE products for retailers and wholesalers should be well managed with the help of the government and producers in order to distribute good quality products to remote areas. Electric appliance shops could be registered in order to get supports and benefit from the governments e.g. information, training, knowledge and financial support. Although there is availability of EE products in the market, low quality products with cheaper price are still abundantly available in the market. The government must at least enforce Minimum Energy Performance (MEP) measure to screen those products out of the market. This should not only help to reduce energy consumption but also to increase the safety of using them.

Consumer's behavior is considered as key factor in the EE market. If customers have enough knowledge on energy efficiency with the adequate financial support, there will be a demand on high quality products, which affect to electric appliance market as a whole. Government could also provide energy efficiency training to retailers and wholesalers to spread the message of the benefits of EE products by using simplified communication to low income customers.

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