

# Do Households in Developing Country Choose Energy Efficient Air Conditioner?: Evidence from the Philippines

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## 1. Introduction

According to the latest energy consumption survey in the Philippines, the third largest end-use electricity by households is space cooling and air conditioning (Department of Energy, Philippines, 2011). Currently, air conditioners (hereafter AC) are used by around 20% of Metro Manila's population of 13 million and less than 10% of the Philippines' population of 107 million. The percentage of AC owners is expected to increase in the future due to economic growth. Hence, one of the effective energy-saving behaviours that households can take is choosing energy efficient AC. How do we incentivise households to choose energy efficient AC? To answer this question, we will conduct face-to-face survey in Metro Manila, the capital city of Philippines. The survey includes choice experiment questions on AC alternatives, hence, the basic preferences and willingness-to-pay (WTP) for each attributes of AC can be estimated. The survey will also reveal what information encourages consumers to choose energy efficient AC.

## 2. Survey Design

In order to develop the survey instrument, we conducted preliminary surveys, which is especially important for choosing attributes and its levels on choice experiment questions. The preliminary surveys include market research, two focus group discussions (hereafter FGD) and Pre-Test in February and March 2019. We have twelve participants for FGDs and five respondents for Pre-Test who are mix of male and females from 25 to 45 years old and purchase decision-makers for appliances. Reflecting the preliminary surveys, we set four attributes including *Purchase Price*, *Country of Manufacturer*, *Additional Function*, and *Energy Efficiency*. Because there is a physical limitation to install either split type or window type AC, we set six choice experiment questions for each type of AC, leading to twelve choice experiment questions in total. One of our main objectives is examining what type of information encourages consumers to choose energy efficient AC, hence, we will divide

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our sample into three-treatment groups with different information on *Energy Efficiency*. For selecting three information, we conducted hearing surveys at Department of Energy and Manila Electric Company (Meralco) in May 2019. These hearings led to set the following information as *Energy Efficiency*; *Energy Efficiency Ratio (EER)*, *Estimated Costs per Hour*, and *Energy Rating Star*. *EER* is the information on the energy label issued by the government and *Estimated Costs per Hour* is the one on the label issued by Meralco. Only *Energy Rating Star* is the hypothetical information.

### 3. Methodology

The objective of using choice experiments is to investigate people’s preferences across a set of alternatives expressed as a bundle of attributes. Respondents are asked to choose either their most preferred AC among two options or choose “I purchase neither AC 1 nor AC 2” (see Table 1). We will examine whether and how attribute(s) significantly affect decision-making for AC by applying random parameter logit model which can relax restrictions of homogeneity of preferences and independence of irrelevant alternatives that are assumed by conditional logit model.

**Table 1: An Example of Choice Set for Window Type AC**

	AC 1	AC 2	<b>I purchase neither AC 1 nor AC 2</b>
<b>Purchase Price</b>	PhP 25,000	PhP 30,000	
<b>Additional Function</b>	Noise Reduction	Smart Function	
<b>Country of Manufacturer</b>	Philippines	Japan	
<b>EER</b>	11	15	
<b>Choose One</b>			

### 4. Conclusion and Further Tasks

We conducted a sequence of preliminary surveys in Philippines to design the questionnaire for the field survey which aims to examine preferences for attributes of AC. The FGDs and Pre-Test found as follows. Firstly, people indeed want to purchase AC with high efficiency because electricity rate in the Philippines is extremely high. Secondly, however, the current information label (*EER*) issued by the government is not easy enough for people to understand and would not encourage consumers to choose the energy efficient AC. This result will be further validated in the analysis of the field survey that is conducted in June and July 2019 in Metro Manila.

### Reference

Department of Energy, Philippines, 2011. 2011 Household Energy Consumption Survey.

<https://psa.gov.ph/sites/default/files/HECS%202011.pdf> (Accessed 13 June 2019)