THE COLLABORATIVE LABELING AND APPLIANCE STANDARDS PROGRAM

Market Research on Energy-Efficiency Air-Conditioners in Vietnam

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EXECUTIVE SUMMARY

Under a subcontract from the Collaborative Labeling and Appliance Standards Program (CLASP)[1] as well as complementary support from the World Bank, Econoler is working with the Government of Vietnam and the Ministry of Industry and Trade (MOIT) towards implementing an Energy Standards and Labeling Program designed to remove barriers that have persistently hindered the widespread manufacturing, importation and adoption of energy-efficient appliances.

In order to design a pilot program for labeling of air conditioners, surveys and interviews were conducted with customs officials in order to document the state of the market as well as the principal barriers to a scaling-up of energy-efficient appliances. The market appears to be highly crowded with importers and distributors of these appliances while only a handful of manufacturers are actually based in Vietnam, some of which only act as "assembly plants" for foreign-designed AC units.

The study included a survey of 74 of the largest manufacturers, importers and distributors of air conditioners and indicated that approximately 400,000 small to medium sized air conditioners were sold in 2008 in Vietnam. The study further indicated that that the efficiency levels ranged from very low to high. Lastly, it was found that there was no strong correlation between the price and efficiency of air conditioners.

The increase in sales of AC units has resulted in increasing pressure on the grid/electricity supply. These increased sales partly due to the improving economic conditions of the Vietnamese middle class and to an increase in economic activity through the channel of small- and medium-sized companies (SMEs). These trends are likely to continue into the future suggesting that now is an ideal time to implement S&L.

Market actors identified manufacturers and retailers as the most important and reliable sources of information on AC units. When purchasing an AC unit, upfront costs and operating costs (life-cycle energy costs) are the most important factors. Energy efficiency is thus deemed either important or very important by virtually all consumers. So far, it appears that the energy efficiency performance of appliances is ill documented. There are several discrepancies on the market (such as very cheap energy-efficient devices or very expensive non-efficient devices), which basically shows that there are imperfections in the information provided to the consumer.

The main barrier to energy-efficient devices is that there are no clear grounds on which to discriminate between highly energy-efficient models and inefficient ones. The upfront cost of the units thus remains the only reliable factor as far as economic reasoning is concerned. A standards and labels program, which could overcome this barrier, would be welcomed by all manufacturers. Retailers and importers, however, have virtually nonexistent knowledge of the concepts of standards and labels, which could

[1] CLASP is receiving financial support for this work by the Institute of Energy Economics Japan (IEEJ) and the Japanese Ministry of Economy Trade and Industry (METI).

cause some resistance to change. This is why it is recommended to conduct strong and adequate awareness-raising and capacity-building activities with this group of market actors.

The application of an aggressive labeling program coupled with the announcement of an upcoming mandatory minimum energy performance standard could reduce the deemed increase in peak demand and use of electricity from 250 MW per year to around 200 MW per year. It is thus crucial to get started as soon as possible with a pilot project.

1 INTRODUCTION

Under a subcontract from the Collaborative Labeling and Appliance Standards Program (CLASP) as well as complementary support from the World Bank, Econoler is working with the Government of Vietnam and the Ministry of Industry and Trade (MOIT) towards implementing an Energy Standards and Labeling Program designed to remove barriers that have persistently hindered the widespread manufacturing, importation and adoption of energy-efficient appliances.

In order to design a pilot program for labeling air conditioners, it is necessary to first find out:

- the size of the market;
- the range of energy efficiency levels,
- where products are made and the relative position of local manufacturers in the market;
- the growth in annual energy consumption due to new units being sold, etc.

Since no surveys have been carried out before in Vietnam on these topics, there was no local information on which to base the design of a labeling pilot program for air conditioners.

Econoler implemented an initial survey under its World Bank project. This survey targeted at least 50 manufacturers, importers and retailers, but complications and lack of time made this target impossible to reach. In the end, only 31 interviews were completed from the middle of August to the end of September 2008. The complications were caused by unclear questions in the surveys and scheduling difficulties with the main stakeholders given the short lead time.

With the help of CLASP (and funding from IEEJ and METI), additional survey work was fielded during the month of February 2009. This increased the total sample by 74 additional interviews. In addition, an interview with officials from Customs was scheduled to find out more about the air conditioner market and the available data. The methodology used and results of the survey are discussed in the following report.

2 RESEARCH OBJECTIVES AND METHODOLOGY

2.1 MARKET SURVEY OBJECTIVES

The objectives of the market survey were to:

- Identify the market channels and main players for air conditioners.
- Determine the annual sales of air conditioners in recent years and expected sales in upcoming years, including imported and locally-produced units.
- If possible, classify air conditioners under the following categories:
  - single packaged (in windows or wall units)
  - split packaged
  - multi-split
  - single duct
- Determine the energy efficiency level of the units available for sale.
- Assess the capability of responding companies to produce or import more energy-efficient units.
- Explore whether a correlation exists between the initial retail price and the energy efficiency levels of air conditioners.
- Determine how and to whom air conditioners are sold.

In addition, companies were asked about their attitudes toward energy efficient air conditioners.

Most questions were developed with close-ended answers, leaving only some open-ended questions to fill. This method was used based on our experience with the first survey efforts. Some incomprehension from the interviewers resulted in unusable answers. Thus close-ended answers were offered, leaving one field open to input answers which were not listed. We are confident that our sample is representative of the market, knowing that having 74 participants within a huge population would normally represent a confidence level of 90% with a standard deviation of 10%.

The survey form is attached as APPENDIX A.

2.2 IDENTIFICATION OF MARKET CHANNELS AND MAIN PLAYERS

The first step of the market survey was to identify the market channels for air conditioners and the manufacturers, importers and major retailers responsible for distributing the majority of air conditioner units in Vietnam. No known database of such companies existed in Vietnam. There is not, for example, a Vietnamese appliance manufacturer or similar industry association that could provide ready data. Thus, even this basic level of information had to be generated through primary research (as opposed to secondary research base on literature reviews of existing sources) To initiate this research, a member of the staff at MOIT undertook a search on the web and called a number of air conditioner suppliers and manufacturers. This search revealed approximately 14 manufacturers and

50 importers, as well as a handful of distributors that appeared to import, distribute and, in some cases, sell air conditioners.

A member of the Econoler team then called every company on the list to determine the name and address of the general manager. Table 1 shows the number of manufacturers, importers and retailers interviewed for this survey according to geographic location.

Table 1: Number of Manufacturers, Importers and Retailers Interviewed

Location	Manufacturers	Importers	Retailers	Total
Hanoi	4	8	8	20
Vung Tau	-	-	8	8
Can Tho	-	-	8	8
Hai Phong	-	-	13	13
HCM City	6	6	13	25
Total	10	14	50	74

It is important to note that some confusion exists among the three categories. For instance, three manufacturers are Vietnamese companies while other manufacturers appear to be assembly plants for large foreign brands - local manufacturing has some financial advantages - or, in some instances, to just import units from a foreign manufacturer. Some importers are also distributors and *vice versa*. Smaller importers appear to be located near the border cities and ports. The situation with regards to retailing is also complicated. A distributor may, for example, supply its own chain of retail outlets plus a number of independent retailers.

3 RESEARCH FINDINGS

This section deals with the appraisal, by respondents, of the structure of the AC market in Vietnam, explores the link between energy efficiency and the price of AC units and analyzes the main barriers to a scaling-up of energy efficient AC units. These results will, in turn, inform an analysis on the potential for energy efficiency labels in the Vietnamese context.

3.1 STRUCTURE OF THE VIETNAMESE AC MARKET

In 1994, there were 100 brands of air conditioner products on the Vietnamese market. In 2006, only 5% of these products remained[2]. Currently, Vietnam is a major importer of ACs and most of its manufacturing industry assembles products using parts imported from foreign companies.

Respondents to the market survey mainly identified small and medium-sized enterprises as the major customers for their products (such as restaurants and small hotels). They also mentioned that middle-class households represent an even more important customer base than high-income households. Presumably, the proportion of middle-class households in the general population is growing and is expected to grow even more, and these households can now afford air conditioning. Small numbers of ACs are even sold to low-income households according to the interviewees.

Given this likely increase in the size of the middle class, now is a timely moment to introduce energy-efficient products, given that AC units usually have a long lifespan and that this could make a significant difference in the future.

[2] Information obtain from interview with Customs

3.2 SALES OF AIR CONDITIONERS

As shown in Table 2, the annual sales of AC units have been growing steadily over the last three years. It is important to note that only eight months are accounted for in the numbers given for 2008 based on customs data (the last three months had not been compiled yet at the time of our interview). By extension, the total number of ACs for 2008 would amount to nearly 400,000 units.

Table 2: Estimates of Sales of Room Air Conditioners

Estimates of Sales by Surveyed Retailers and Distributors	**n**	**2006**	**2007**	**2008**
Total room A/C units sold in the residential sector (all manufacturers and importers)	68	98,153	130,825	169,053
Total room A/C units sold in the commercial sector (all manufacturers and importers)	67	130,560	170,218	225,269
Total (residential and commercial)		228,713	301,043	394,322
Number or percent of room A/C units produced locally for local sales	69	18.2%	26.8%	38.1%
Sales estimates based on Customs data		300,000	350,000	263,000* (400,000)**

*For first eight months only
** Normalized to 12 months

Survey results show that the commercial market represented the single biggest share of business for AC units. Given the low standard variation in the distribution of answers, we have a high degree of certainty, that these figures are representative of reality. As hypothesized, the share of sales in the residential sector has been growing quite rapidly and significantly.

As for the discrepancy between the survey estimates and the estimates of sales based on Customs data, it is also consequent with the nature of the data. It is common for distributors and retailers to store larger quantities of units (compared to their sales). Thus, the amount of units recorded by Customs might well be the result of pre-emptive storage of AC units by distributors. The fact that the Customs data and survey data concord for 2008 shows that the market might have reached an equilibrium where the intake of AC units is roughly equivalent to the domestic demand.

Respondents also unanimously mentioned that the market has been (and still is) increasing. Over the last few years, there has been an estimated 30% increase in the sales of AC units. The standard variation for this estimate is only 0.16, which posits a relatively high degree of confidence. This increase is mainly explained by “higher demand as a result of higher living standards, higher incomes, more construction projects and good prices”. In the next few years, this rapid progression is deemed to slightly slow down to 20% (standard variation of 0.11). The continued increase will be fuelled by the same factors that provoked the initial increase in sales.

3.3 SOURCES AND CONTENT OF THE INFORMATION PROVIDED

When buying AC units, residential as well as commercial clients seek information from manufacturers (34.6%) and from salespeople (25%). Another portion of surveyed distributors and retailers (23.1%) indicated that the advice of friends and relatives was also sought by people interested in buying an AC unit. Other sources of information such as advertising, “buying magazines”, the Internet, information from governmental agencies and energy use information on labels account for 17.3%. Manufacturers are the most trusted people when it comes to the reliability of the information provided (43.4%). They are closely followed by friends and relatives (39.8%).

The following table indicates what type of information about AC units was provided by the respondents.

Table 3: Information Provided by the Respondents (Multiple answers)

Kind of Information Provided	n	% of total
Cost	56	28.3%
Capacity	37	18.7%
Origin of product	29	14.6%
Energy Consumption	24	12.1%
Technical information	18	9.1%
Warranty	11	5.6%
Power	8	4.0%
Technical standards	6	3.0%
Quality of product	3	1.5%
Maintenance	2	1.0%
Life-span of product	1	0.5%
Quantity	1	0.5%
Energy savings	1	0.5%
Services	1	0.5%

3.4 CURRENT ROLE OF ENERGY EFFICIENCY

The Importance of Energy Efficiency

When asked about the most important factors for consumers when considering buying an AC unit; reliability, durability and price were the most cited by survey respondents. Complete answers are presented below:

Table 4: Most Important Factors for Consumers when Buying AC (Multiple answers)

What is Most Important in an AC Unit?	n=	Percentage
Reliability or durability	35	29.17%
Purchasing price	34	28.33%
Brand name or reputation	12	10.00%
Energy savings/electricity use	7	5.83%
Warranty or guarantee	6	5,00%
Appearance or size	5	4.17%
Cooling ability/capacity	5	4.17%
Dealer's reputation	5	4.17%
Operating cost	5	4,17%
Noise level	4	3.33%
After sales service	2	1,67%
Other:	0	0.00%
	Total	100.00%

As can be extracted from the table, energy savings and electricity use seem to be, at best marginally, a factor in the purchasing decision. A subsequent question, aimed at probing the respondents on the effect of "energy efficiency" and "cost of operating the air conditioner" in the purchasing decision, yielded a somewhat different outcome: 55.4% of the respondents indicated that, in their opinion, those two factors were "very important". 43.2% of the respondents indicated that they were simply "important".

What can be extracted from these results is that energy efficiency and operating costs, while they are not cited as primary (most important) factors for all, are nonetheless deemed generally very important considerations in the purchase of AC units.

Efficiency Level of Units Available for Sale

With regards to the type of AC units available, there is an overwhelming presence of only two types of models. These are the "Split, cool only" and "Split, reverse air cool" models. "Single package, cool only", "Single package, reverse air cool", "Single duct, cool only", "Multi-split, cool only" and "Multi-split, reverse, air cool" models were not cited at all by respondents.

The mean cooling capacity state of units is 3.5 kW, the mean COP is 3.02 and the suggested retail price for a standard model oscillates around VND 7.7 million. The relation between the COP and the cooling capacity state is provided in the following figure:

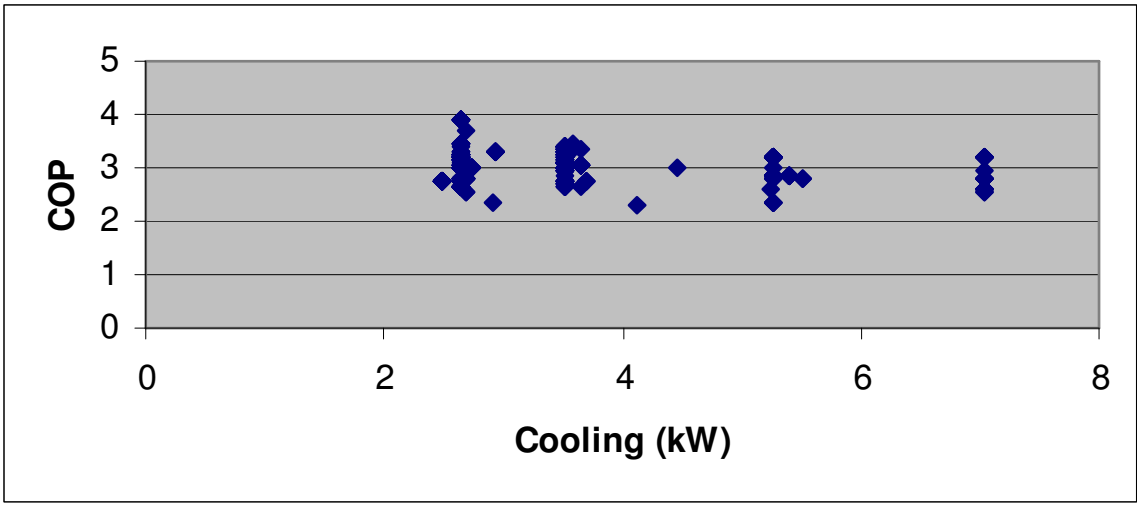

Figure 1: Range of Efficiency Levels of Models Surveyed

As shown, the cooling capacity state is a very weak predictor of the COP. It is thus safe to assume that these two variables are virtually independent from one another. The only observation possible is that the COP has a widest range in the lowest category of cooling capacity state.

There is a significant range of efficiency levels of the air conditioner models on the market, as seen in figure 1. This indicates that Energy Performance Labeling and Minimum Energy Performance Standard Programs can have a worthwhile effect.

Correlation Between Retail Price and Efficiency

Performance and price data from the survey seem to be of variable quality; in some cases, this could be due to the respondent being a non-technical person and becoming confused over the various figures available.

As for the relationship between the COP and the normalized retail price, the COP is a very weak predictor of the normalized retail price of AC units, meaning that there is no strong link of causality between these two. In the 2.5 to 3.6 COP, there is indeed a vast price range (between VND 4.9 million and VND 15 million) – see following figure:

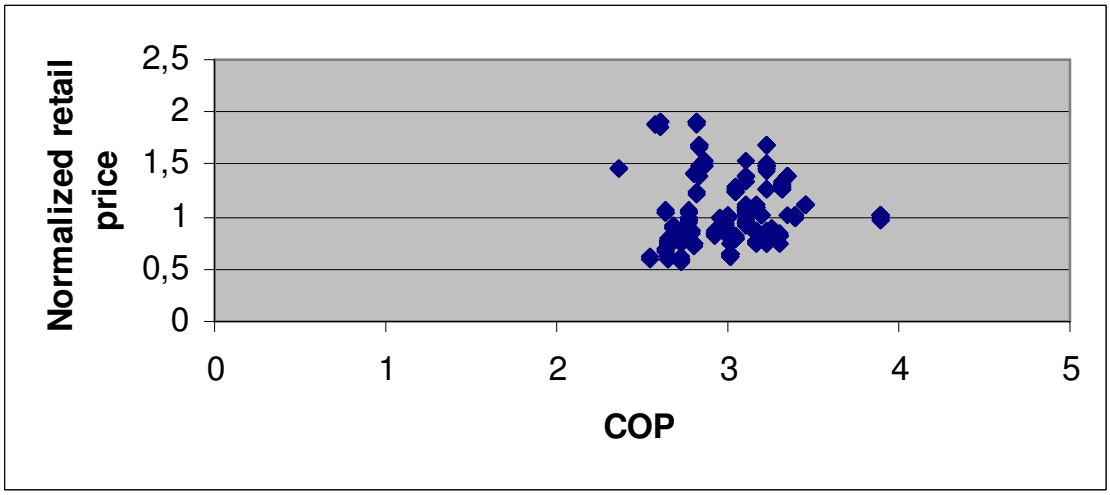

Figure 2: Price/Efficiency Relationship

In general, higher efficiency models do not seem to cost more than regular models, which can basically be explained by two non mutually-exclusive factors: (1) some low COP AC units could be sold at very high (unjustified) prices and/or (2) some inefficient devices might be tested in a biased way, leading to an apparently high COP with low (or average) prices.

Some of the variations may also be masked by other features, such as the presence of a remote control or a digital control system. Nevertheless, we can conclude that the most efficient models are relatively expensive. These models are inverter types, which are generally known to be the most expensive models available on the market.

From experience, high efficiency models are generally not more expensive in the long run. However, a change in design and consequent changes to production lines do represent costs, and these have to be recovered. For analysis purposes, it may be appropriate to assume that, over the range of efficiency levels being considered, a 20% increase in Energy Efficiency Rating (EER) will result in a temporary 20% increase in cost. For the purpose of program design, it is best to reduce the number of changes - and increased costs due to those changes - by making any Minimum Energy Performance Standard (MEPS) relatively stringent at first while simultaneously providing long lead times in implementation or effect. Local manufacturers can then make the necessary changes to their designs and production lines several years in advance.

3.5 BARRIERS FOR EE AIR CONDITIONERS

As for the barriers to consumers buying AC units, cost at purchase (upfront cost) and (high) energy consumption of AC units are the most frequently cited (35.6% and 30.1% respectively). This is coherent with the important characteristics of an AC unit when buying (with reliability and durability being a *proxy* variable of the cost of the appliance).

Based on discussions with stakeholders, purchasing decisions are made on the basis of factors not related to energy use or efficiency. This is partly due to the limited information available on these topics, either at point of purchase, where many decisions are influenced, or elsewhere. Advertisements generally focus on features other than efficiency and operating cost (an exception is a Panasonic campaign that linked its inverter models with high efficiency). Durability is clearly a very important driver, and brand name and price also play strong roles. Information about these factors is considerably more visible than energy efficiency.

From the suppliers' perspective, there is a lack of customer demand for high efficiency, while improving efficiency would increase costs and hence prices (cited as a barrier by 90.3% of the respondents), leading to a probable reduction in sales. As part of the process, production lines would need extensive modification, probably interrupting production.

However, it seems that it is important for the manufacturers to improve the energy efficiency of their room air conditioners (inasmuch as it is economically beneficial to do so), because it is arguably "good for the brand image".

When asked if they were familiar with the principle of "standards and labeling programs", manufacturers all mentioned that they were indeed. All 8 manufacturers thought standards and labels were a good idea, and 5 of them thought they were in fact "necessary". All manufacturers also demonstrated that they approve of the idea that an independently accredited laboratory be responsible for conducting the tests in order to apply the labeling procedure. Good management of the laboratory and assignment by a third party are the main conditions to be met in order to ensure the manufacturers' full support. As for a pilot program to test out standards and labeling for room air conditioners, all manufacturers showed interest in being part of it. The respondents think this is good for business as it objectively demonstrates the product's quality and that, in doing so, helps consumers differentiate between products and trademarks.

As for the distributors and importers, their knowledge of standards and labels is virtually nonexistent. When probed for their opinion on standards and labels, answers were highly scattered between several answers such as "Good idea, necessary", "Need to inform consumers", "Labeling party must be prestigious", "Labeling needs to be fast, clear", "Need to refer to existing standards", "Need to focus on prestigious brands first, as part of a pilot program", etc.

Suppliers consider that a properly conducted Energy Performance Labeling and Minimum Energy Performance Standard Programs would overcome the barriers.

4 CONCLUSIONS AND RECOMMENDATIONS FOR VIETNAM'S AC S&L POLICY

A survey of 74 of the largest manufacturers, importers and distributors of air conditioners indicated that approximately 400,000 small to medium sized air conditioners were sold in 2008 in Vietnam and that the efficiency levels ranged from very low to high. It was found that there was no strong correlation between the price and efficiency of air conditioners.

Air conditioners are penetrating the Vietnamese domestic market in significant numbers, and this will increase the peak demand and use of electricity. The peak demand will increase at the rate of around 250 MW per year. The application of an aggressive labeling program coupled with the announcement of an upcoming mandatory Minimum Energy Performance Standard could reduce that increase to around 200 MW per year.[3] It is common for countries to start with a labeling program and to introduce a more stringent (mandatory) performance standard later on. In doing so, the market actors have a chance to prepare themselves and adjust their production and marketing practices. This also diminishes the risk of non-compliance when the standards are introduced. The key element of success in this sequence of labeling and mandatory standard is a government commitment, as defined in a clear timeframe covering the implementation of a label pilot scheme, a full-scale label scheme and, finally, the implementation of mandatory performance standards.

This additional research effort was useful in determining that every major manufacturer interviewed (10 out of 10) was willing to participate in a voluntary labeling program. They mentioned that they already knew about such programs elsewhere and thought it would be valuable to demonstrate their product's quality. From their point of view, it might even help consumers to differentiate between trademarks.

This research effort also showed that there was no knowledge about labels and standards among distributors and importers. This constitutes a significant knowledge gap, and any pilot scheme should take this fact into account. Because they are the principal source of information for consumers on efficient ACs (as demonstrated by the results), manufacturers and retailers are also key in overcoming barriers to energy efficiency. From the results obtained, we can affirm that those barriers mainly pertain to a deemed increase in costs for the manufacturers as a result of the standards and labels. Most respondents mentioned that improving the efficiency of ACs would increase their product's cost since it would require expensive modifications to their product line. The S&L program should start by informing and training the manufacturers on the possible energy conservation measures (ECM), which can easily improve efficiency without necessarily requiring huge investments.

Awareness raising activities should also be undertaken with the general population, so as to provide an incentive to consumers to buy products that are identified as labeled.

[3] Source : MOIT

APPENDIX

Appendix A – Survey form

Vietnam Pilot Program on Energy Standards and Labeling (080506)
Market Survey – Sales of air conditioners
Manufacturers, Importers, Distributors of A/Cs
December 19, 2008

Respondent Name/Telephone Number/email _____

Company _____

Address (street address, city, province, postal code) _____

Other contact information/website etc _____

Type of company Manufacturer Importer Distributor Other _____

Hello, thank you for meeting with us today. We are working with MOIT to better understand the room air conditioner market in Vietnam and how it is changing. You and your company have been identified as a very important source of information about this market. The information you give me is confidential. Your answers will not be identified with you or your company. We will combine all the answers to create a picture of the overall market. We greatly appreciate the help you are providing us.

Section 1: Warm Up Questions

1. First, can you tell me your position/title at your company and more about what you do?

2. Now can you tell me a little more about your company?
   -the appliances are manufactures or handles _____
   -how many locations you have in Vietnam _____

2A Do you manufacture or import room air conditioners? By room air conditioners I mean air conditioners that have up to 14 kilowatts or 48000 BTU/h cooling effect.

-Where are your air conditioners manufactured? _____
-Where are your main distribution centers? _____
-Where are your air conditioners designed? _____
-What about the production engineering? _____

3. I'd now like to hear your views on the room air conditioner market for households and smaller commercial businesses. What is your estimate of the size of the market (total annual sales) in Vietnam?

How has that market been evolving over the past few years – say since 2005?

- Probe: Has it been increasing, decreasing, or staying about the same? [**Probe:** Percent change in market?]

1. Increase -- What percent? _____
2. Decrease – What percent? _____
3. Stay about the same
4. Can't say

- Why? _____

4. What will happen to that market over the next few years? Again, will the size of the market increase, decrease or stay about the same? [**Probe:** Percent change in market] Why?

1. Increase -- What percent? _____
2. Decrease – What percent? _____
3. Stay about the same
4. Can't say

Section 2: Marketing and Distribution

5. Could you describe the customers you target for room air conditioners?
Probes:

5.1 What are your target customers like?
1) High income
2) Medium income
3) Low income
4) Medium and small enterprises
5) Other

Demographics?
1) 1 - 2 persons
2) 2 - 4 persons
3) 4 - 6 persons
4) >6 persons

Location?
1) North
2) Central area
3) South

5.2 What factors are most important to them when they buy air conditioners?

1) Reliability or durability
2) Price at purchase
3) Appearance or size
4) Brand name or reputation
5) Noise level
6) Cooling ability/capacity
7) Energy savings/electricity use

8) Dealer's reputation
9) Cost of operation
10) Warranty or guarantee
11) After sales service
12) Other: _____

5.3 How important a factor is energy efficiency or the cost of operating the air conditioner in the buying decision?
1) Very important
2) Important
3) Not important

5.4 What are the biggest barriers to your target customers buying air conditioners?

Answer: _____

6. Based on your experience, what are the best methods to market room air conditioners?

Probes:

6.1 What's the best product factor to mention in your marketing?
1) Product quality
2) Cost
3) Distribution
4) After sales service
5) Other: _____

6.2 What messages and methods, including media, do you rely on to "sell" your products?

Answer: _____

6.3 How do you work with salespeople or shop owners?
1) Income on turnover
2) Income on salary
3) Favorable regulations (Transportation-After-sales)
4) Others: _____

6.4 Do you have any advertising or marketing materials you could show me?
1) Yes (write description of advertising or ask for a copy)
2) No

_____

7. Where do your customers get information about what air conditioner to buy?
1) Salespeople
2) Manufacturer
3) Friends/relatives
4) Advertising
5) "Buying Magazine"
6) Internet

7) Information from a government agency
8) Energy use information on a label
9) Others: _____

7.1 Who do customers trust the most for information?
1) Salespeople
2) Manufacturer
3) Friends/ Relatives
4) Advertising/"Buying Magazines"
5) Internet
6) Information from government agency
7) Energy use information on a label

7.2 What kind information do you provide about the units? Do you have some examples you could give me? (Technical specification, Energy consumption, etc)
Answer: _____

8. What kind of distribution network do you use to sell room air conditioners?
1) 0 level (manufacturer - customers)
2) 1 level (manufacturer-Retail-Customers)
3) 2 levels (manufacturer-Wholesale-Retail-Customers)
4) 3 levels (manufacturer-Wholesale-Agency-Retail-Customers)

Section 3: Market and Performance Information

9. Now I hope you will tell me more about your products by helping me fill out this table (***Example below. Expanded table put on separate pages to hand to respondent)***. I'd like to start with your most popular model.

Code for Model/Type **Single package, cool only 1** **Single package reverse air-cool 2** **Split, cool only 3** **Split, reverse air cool 4** **Single duct, cool only 5** **Multi-split, cool only 6** **Multi-split, reverse, air-cool 7**								
Brand and model number	**Model type**	**Cooling capacity**	**Rated Input Power** (Watts) *or* **EER**	**Popularity** **High 1** **Medium 2** **Low 3**	**Total Production**			**Suggested retail Price**
					2006	**2007**	**2008**	

To follow-up on a few things on this table.

9.1a Are your efficiency figures based on test results?
1) Yes (if Yes, ask 9.1b)
2) No (if No, ask 10)

9.1b What test standard do you use?

Answer: _____

9.1c What test conditions (i.e. indoor and outdoor dry-bulb and wet-bulb temperatures) are used? Is it ISO T1 or another test condition?

Answer: _____

9.1d What test laboratory do you use – a manufacturer's test laboratory or an accredited independent test laboratory?

Answer: _____

10. I'd also like you to help me fill in this table (share table below with respondent) so that we can get a better picture of the overall market for **room air conditioners** for Vietnam and how it is changing. I am just asking for your "best estimate" here. This information is confidential and your company's name will not be attached to the information you give me.

	2006	**2007**	**2008**	**2009**
Total room A/C units sold to residential (all manufacturers and importers)				
Total room A/C units sold to commercial(all manufacturers and importers)				
Your company's share of sales of total room A/Cs (residential and commercial -- # or percent)				
Number or percent of room A/C units produced locally				

Section 4: The Future

11. How do you see the room air conditioner market changing over the next few years, in terms of the type of products you will sell, the business strategy your company will use to sell them, and any other factors?

Answer: _____

12.1 How important is it for your company to improve the energy efficiency of the room air conditioners you sell?
1) Important because: _____
2) Not important because: _____

12.2 What stands in the way of having more efficient models? (Use Probes below)

1) Lack of customer demand	1. Yes	2. No
2) Improving efficiency would increase the cost and the price	1. Yes	2. No
3) Inadequate standards	1. Yes	2. No
4) Production lines would need extensive modifications	1. Yes	2. No
5) "Our model are already efficient"	1. Yes	2. No

6) Others: _____

13. MOIT is interested in working with companies like yours to provide more energy efficient air conditioners in Vietnam. Overall, what advice do you have for them that would encourage this?

Answer: _____

14.1 One way many countries have improved the energy efficiency of air conditioners is through a standards and labeling program. Models are tested for efficiency against an agreed upon standards. They receive a rating as to how efficient that model is and the rating is put in a label that consumers can see. The government provides information to retailers and prospective purchasers about the long-term benefits of buying a more efficient model. At some stage, models that do not achieve a minimum level of performance are likely to be prohibited. Are you familiar with this type of system? What do you think of standards and labeling approaches?

Answer: _____

14.2 If you are familiar with performance testing, I would like to ask some detailed questions relating to how a standards and labeling program may operate.

- Do you have any views on what the reference test standard should be? (ISO 5151 is the relevant international test standard.)

Answer: _____

- What set of conditions (temperatures) should be used for the rating? Why?

Answer: _____

- What problems do you see relating to the choice of test standard?

Answer: _____

- What problems do you see relating to the choice of test conditions?

Answer: _____

- One way of improving performance in practice is to have variable speed compressors (often controlled via an inverter). However, the standard test does not reflect their increased part-load efficiency. Do you have any ideas on how this feature should be reflected in a labeling program?

Answer: _____

- Part of the labeling scheme would be testing by an independent accredited laboratory to make sure that manufacturers' claims about the performance of their models are valid. This could be before the model is allowed to carry a label, or it could be in the form of a check test when the labeled model is already on the market. Have you any views or concerns about this?

Answer: _____

15. Might your company be interested in participating in a pilot program to test out standards and labeling for room air conditioners? Why or why not?

1) Yes: _____
2) No: _____

16. Show a list of the manufacturing companies and importing companies that will be interviewed and ask if there are any others not listed that we should be contacting.

THANK YOU SO MUCH FOR YOUR TIME AND HELP TODAY!

EXPANDED TABLE TO FILL OUT FOR QUESTION 9

Start with most popular model.

Code for Model/Type **Single package, cool only 1** **Single package reverse air-cool 2** **Split, cool only 3** **Split, reverse air cool 4** **Single duct, cool only 5** **Multi-split, cool only 6** **Multi-split, reverse, air-cool 7**								
Brand and model number	**Model type**	**Cooling capacity**	**Rated Input Power Watts or EER**	**Popularity** **High 1** **Medium 2** **Low 3**	**Total Production**			**Suggested retail Price**
					2006	**2007**	**2008**	

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