Questionnaire

Project Research Programme on Reducing Energy Consumption Cost and GHG Emission for Tropical Low-income Housing: Thailand Contribution

By

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Group A General information

Section 1 Personal information of the house owner

1. Address ....

2. Date of interview: Day...........Month..........Year..............

3. Respondent status

   ☐ Owner   ☐ dweller   ☐ Renter   ☐ Other (Specify).......................................

4. Age of the respondent .... Year

5. Marriage status

   ☐ Single   ☐ Married   ☐ Widow   ☐ Divorce

6. Family monthly income

   ☐ < 5,000 Baht   ☐ 5,001 - 15,000 Baht   ☐ 15,001 - 30,000 Baht

   ☐ 30,001 - 45,000 Baht   ☐ 45,001 - 60,000 Baht   ☐ > 60,000 Baht

7. Tick ✓ in the table for details of each member of the family (Including the respondent)

Member No.		1	2	3	4	5	6	7	8	9	10
Gender	Male										
	Female										
Age	<15 years										
	16 – 30 years										
	31 – 45 years										
	46 – 60 years										
	> 60 years										
Education	Under Bachelor degree										
	Bachelor degree										
	Upper Bachelor degree										
Occupation	Student										
	Government / enterprise										
	Employee										
	Business										
	agriculture										
	No occupation										
	Other............................										

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Section 2 House general information

1. This house was originally built or renovated ....

   Built in year. .... has been dwelled for ....Years

   In case of the house was renovated, how is the original house configuration...

   ....

2. Type of the house

   ☐ 1-Storey wooden house   ☐ 2-Storey wooden house   ☐ 1-Storey wooden house with basement   ☐ 1-Storey concrete house ☐ 2-Storey concrete house   ☐ 2-Storey wooden-concrete house   ☐ Other (Specify)....................

3. All residential area..................m^2 House usage area...............m^2

4. There are totally....................rooms in the house

   ☐ Bedroom............room(s)   ☐ Bathroom .... room(s)   ☐ Kitchen.......... room(s)

   ☐ Living room.......... room(s)   ☐ Other (Specify).. room(s).

Group B Energy consumption data

Section 1 Energy consumption record

1. Amp meter size

□ 5 A   □ 10 A   □ 15 A   □ Others (Specify)..

2. Monthly electricity consumption

□ < 150 Unit   □ 151-300 Unit   □ 301-450 Unit   □ 451-600 Unit

□ 601 – 750 Unit   □ 751-900 Unit   □ 901-1,050 Unit   □ > 1,051 Unit

 3. Monthly electricity cost

□ < 300 Baht   □ 301-500 Baht   □ 501-1,000 Baht   □ 1,001-1,500 Baht

□ 1,501-2,000 Baht   □ 2,001-2,500 Baht   □ 2,501-3,000 Baht   □ > 3,000 Baht

Section 2 Lighting energy consumption

For interviewers;

Fill following number for each usage area

1. Working room   2. Living room   3. Multi-purpose room   4. Bedroom   5. Kitchen   6. Bathroom   7. Spaces around the house   8. stables   9. garage   10. Other (Specify)...

Fill following number for each luminaire types

Luminaire types	Figures
1. Short/long fluorescent lamp	
2. Circle fluorescent lamp	
3. Incandescent lamp	
4. Compact fluorescent lamp	

5. LED

Section 2 Lighting electricity consumption (Cont.)

Rooms	Luminaire type......................				Luminaire type......................				Luminaire type......................				Luminaire type......................				Luminaire type......................			
	Watt	Quantity	Usage		Watt	Quantity Hrs/Day	Usage		Watt	Quantity Hrs/Day	Usage		Watt	Quantity Hrs/Day	Usage		Watt	Quantity Hrs/Day	Usage	
			Hrs/Day	Day/Week			Hrs/Day	Day/Week			Day/Week	Day/Week			Day/Week	Day/Week			Day/Week	Day/Week
1.																				
2.																				
3.																				
4.																				
5.																				
6.																				
7.																				
8.																				
9.																				

Section 3 Cooking energy consumption

For interviewers;

Fill following number for each usage area

1. Rice cooker/ fryer   2. Electric stove   3. Electric frying pan   4. Electric kettle / coffee pot   5. Toaster   6. Electric grill   7. Electric oven

8. Blender   9. Microwave   10. Gas Oven   11. Burner gas cooker   12. Brazier nude model   13. Brazier cylinder

14. High efficiency Brazier   15. Three-legged iron stove or oven stones 3 pieces   16. Biogas stove   17. Other (Specify)...

Size :   In case of energy source is electricity and solar cell fill "Watt" and fill "Kg/day" for the others.

Usage : In case of many appliances which are the same sizes, combine the usage quantity.

Fuel types	Appliance..........						Appliance						Appliance				
	Size	Quantity	Usage				Size	Quantity Weekday Weekday	Usage				Usage Weekday	Usage	Usage			
			Weekday		Weekend				Weekday		Weekday				Weekday		Weekday	
			Hour/Day	Day/Week	Hour/Day	Hour/Day			Hour/Day	Day/Week	Hour/Day	Day/Week			Hour/Day	Day/Week	Hour/Day	Day/Week
1. Electricity																		
2. Solar energy																		
3. LPG																		
4. firewood																		
5. charcoal																		
6. husk																		
7. coconut Shell																		
8. The coconut rumors																		
9. blurred																		
10. biogas																		
11. Agricultural Residues (Specify)...............																		
12. Other (Specify)...............																		

Section 4 Entertainments

Appliance type	Room.....................				Room.....................				Room.....................				Room.....................				Room.....................			
	Size	Quantity	Usage		Size	Quantity	Usage		Size	Quantity	Usage		Size	Quantity	Usage		Size	Quantity	Usage	
			Hrs/Day	Day/Week			Hrs/Day	Day/Week			Hrs/Day	Day/Week			Hrs/Day	Day/Week			Hrs/Day	Day/Week
1. TV																				
☐ CRT																				
☐ Plasma																				
☐ LCD																				
☐ LED																				
2. The Stereo																				
☐ VCD																				
☐ DVD																				
☐ BlueRay																				
3. Radio																				
4. Computer																				
☐ PC																				
☐ Labtop																				
☐ Printer																				
5. Telephone/Fax																				
6. Mobile phone																				
7. Other................																				

Section 5 Convenience

Appliances	Size	Quantity	Usage rate			Energy source
			Hrs/Day	Day/Week	Week/Year	
1. Electric hair dryer	……………….Watt					☐ Solar energy
2. Electric Sewing	……………….Watt					☐ Solar energy
3. Fan	……………….Watt					☐ Solar energy
	……………….Watt					☐ Solar energy
	……………….Watt					☐ Solar energy
5. Air-conditioner	……………….BTU					☐ Solar energy
	……………….BTU					☐ Solar energy
	……………….BTU					☐ Solar energy
7. vacuum cleaner	……………….Watt					☐ Solar energy
1. Electric water heater	……………….Watt					☐ Solar energy
4. Electric kettle	……………….Watt					☐ Solar energy
5. Iron	……………….Watt					☐ Solar energy
6. Refrigerator	……………….Watt					☐ Solar energy
8. Washing machine	……………….Watt					☐ Solar energy
9. Game player	……………….Watt					☐ Solar energy
10. Water pump	……………….Watt					☐ Solar energy
10. Other (Specify)…………….	……………….Watt					☐ Solar energy

Section 6 Small business

Appliances	Sizes/Types	Quantity	Usage rate		
			Hrs./Day	Day/Week	Week/Year
1. Electric hair dryer	...................Watt ....Watt				
2. Electric Sewing	...................Watt				
3. Washer	...................Watt ....Watt ....Watt ....Watt				
3.Clothes dryers	...................Watt ....Watt ....Watt				
4. Electric irons	...................Watt ....Watt ....Watt				
5. Other (Specify)	...................Watt				

Section 7 Small industry

Appliances	Sizes/Types	Quantity	Usage rate		
			Hrs./Day	Day/Week	Week/Year
1. kiln ☐ LPG ☐ charcoal ☐ firewood ☐ Other (Specify)	...........................Day/ tank Tank size...........................kg. ....kg./Day ....kg./Day ....kg./Day				
2. stove ☐ LPG ☐ Electricity	...........................Day/ tank Tank size...........................kg. ....Watt				
3. oven ☐ Electricity ☐ LPG ☐ charcoal ☐ firewood ☐ Other (Specify)	...................Watt ....kg./Day ....kg./Day ....kg./Day ....kg./Day				
4. Boiler ☐ Electricity ☐ LPG ☐ charcoal ☐ firewood ☐ Other (Specify)	...................Watt ....kg./Day ....kg./Day ....kg./Day ....kg./Day				
5. freezer	...................Watt				
6. Other (Specify)	...................Watt				

Section 8 Transportation

Types	Size	Quantity	Usage rate		
			Watt or Liter/Day	Day/ Week	Week/Year
1.Motorcycle ☐ Electricity ☐ petroleum	Size.......................Watt/C.C.				
2. saloon ☐ Electricity ☐ petroleum ☐ LPG ☐ NGV	Size.......................Watt/C.C.				
3. pickup truck ☐ Electricity ☐ petroleum ☐ LPG ☐ NGV	Size.......................Watt/C.C.				

Group C Changing of energy use types

Do you have a plan to change type of energy uses?

☐ Change ☐ Not Change

↓

If yes, What type of new fuel will you use, when do you plan to change and what is the reason?

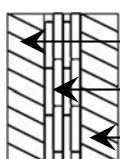| New fuel	Reason of changing
1. Electricity	1. Easy to buy
2. LPG	2. Energy conservation
3. Solar energy	3. Cheap
4. petroleum	4. Safety
5. Firewood	5. For free
6. charcoal	6. Convenient
7. Husk	7. Clean
8. Biogas	8. Other (Specify)........................
9. Other (Specify)........................	

Fill number into the blank
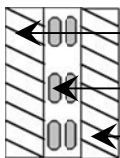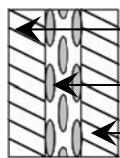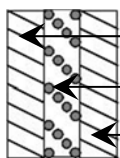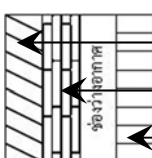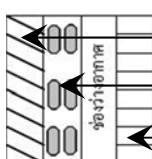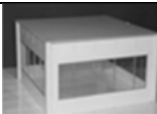
Currently use	Change to be	Year	Reason
☐ Electricity			
☐ LPG			
☐ Solar energy			
☐ petroleum			
☐ Firewood			
☐ charcoal			
☐ Husk			
☐ Biogas			
☐ Other (Specify)........................			

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Group D House construction data

For interviewer ; Fill following number for each room

1. Working room   2. Living room   3. Multiple-purposed room   4. Bedroom   5. Kitchen   6. Bathroom   7. Other (Specify)...................

Wall structure	Exterior Interior
1. Plaster + Concrete block + Plaster	Plaster Concrete block Plaster
2. Plaster + Concrete + Plaster	Plaster Concrete Plaster
3. Plaster + Light weight concrete block + Plaster	Plaster Light weight concrete Plaster
4. Plaster + Brick + Plaster	Plaster Brick Plaster
5. Plaster + Brick + Air gap + Gypsum board	Plaster Brick Gypsum board
6. Plaster + concrete block + Air gap + Gypsum board	Plaster Concrete block Gypsum board
7. Wood	
Roof types	
1. Flat roof 2. Pitched roof 3. hipped roof	

3. House dimension   ....

4. Storey ....

5. Height of each floor ....

6. Roof

    6.1 Configuration ....

    6.2 Material ....

    6.3 Color ....

7. Number of rooms ....

8. Configuration/size and direction of each room

Room type	Number of Usage person	Use air-conditioner?	Time of air-conditioner used	Air-conditioner size	Room dimention	Opaque wall				Glazing			Interior wall		Floor		Ceiling	
						Direction	Size	Thickness	Material/Color	Size	Thickness	Material/Color	Thickness	Material/Color	Thickness	Material/Color	Thickness	Material/Color
Room		O Yes O No	From..... to...															
Room		O Yes O No	From..... to...															
Room		O Yes O No	From..... to...															
Room		O Yes O No	From..... to...															
Room		O Yes O No	From..... to...															

*Fill number if available

Group E : Thermal and visual comfort

1. Interview of thermal comfort

Activity	Cloths	Thermal sensation

Activity	met	Wm^{-2}	W (average)
Sleeping	0.7	40.0	70
Reclining	0.8	46.6	80
Seated and quiet	1.0	58.2	100
Sedentary activity (office, dwelling, lab, school)	1.2	69.8	120
Standing, relaxed	1.2	69.8	120
Light activity, standing (shopping, laboratory experiment, light industry)	1.6	93.1	160
Medium activity, standing (shop assistant, domestic work, machine work)	2.0	114.4	200
High activity (heavy machine work, garage work, if sustained)*	3.0	174.6	300

Item	I_{clo} (unit = clo)
Garment	
T-shirt	0.08
Men's briefs	0.04
Ankle length sock	0.02
Shoes	0.02
Long-sleeve dress shirt	0.19
Thin trouser	0.15
Thick trouser	0.24
Single breasted jacket (thin)	0.36
Single breasted jacket (thick)	0.42
Ensemble	
Brief, long-sleeve shirt, thin trouser, socks, shoes	0.60
Brief, T-shirt, long sleeve shirt, single-breasted jacket, trouser, socks, shoes	1.20

Value	Thermal Sensation	Humid Sensation	Air Movement Sensation
+3	hot		
+2	warm	humid	too breezy
+1	slightly warm	slightly humid	breezy
0	neutral	just right	just right
-1	slightly cool	slightly dry	too still
-2	cool	dry	
-3	cold		

Room types	Measuring time	Activity	Cloth	Thermal sensation	Humid sensation	Air movement sensation
Room						
Room						
Room						

2. Measured data

Room types	Measuring time	Indoor quality						Ambient condition				
		DB Temp	%RH	Wind velocity	Lux	Globe temperature	CO$_2$	DB Temp	%RH	Wind velocity	Lux	Solar radiation
Room												
Room												
Room												