# Appendix B. Detailed questionnaire

**Survey Questionnaire**

Dear Sir/Madam:

Hello! Thank you for your cooperation in this questionnaire survey.

We are the staff of the Renewable Energy Use Behavior Laboratory of Tianjin University. In order to understand the situation of residents adopting photovoltaic power generation technology, we have conducted this questionnaire survey. This survey does not record the name and unit, and there is no right or wrong answer. Please fill it out according to your actual situation.

All the results of the questionnaire are for academic research only. We will abide by the ethical standards of scientific research and keep your answers strictly confidential. Please feel free to answer.

Sincerely thank you for your support and cooperation!

Instructions for filling in:

1. This questionnaire has four parts. Please read the questions and options carefully and answer them carefully.

2. Unless otherwise specified, only one answer can be selected for each question.

3. Please fill in the blanks according to the actual situation, or check the option that is closest to your idea.

**Part I: Basic Information on Household Photovoltaic Installation**

Introduction to home photovoltaic power generation: refers to installing solar power generation and conversion equipment on residents’ roofs to generate electricity for their own use, and the remaining electricity is used to connect to the grid to obtain income (please read this introduction carefully before answering the questions).

**1. Have you installed home photovoltaic power generation?**

a. Yes

b. No

**2. When did you install home photovoltaic power generation? / (year/month)**

**3. Where did you get the information about installing home photovoltaic power generation equipment:**

a. Self-initiated learning

b. Neighbors’ recommendation

c. Relatives and friends’ recommendation

d. Media publicity

e. Village head’s suggestion

**4.The factors you value most when investing in photovoltaic power generation are (multiple choices are allowed):**

a. Equipment factors (maintenance, life, performance, ease of use, etc.)

b. Long-term benefits

c. Intensity of policy support

e. Energy saving and environmental protection

**5.The most direct reason for you to install home photovoltaic power generation equipment is:**

a. Energy saving and environmental protection, love the environment

b. Make full use of light energy resources to obtain income

c. Everyone around me has installed it, so I will install it too

**6.Your attitude towards the local power grid company and relevant national policies:**

a. Active support

b. Relatively supportive

c. Neutral

d. Relatively dissatisfied

e. Negatively dissatisfied

**7. After installing home photovoltaics, what changes have you noticed in your electricity consumption behavior? Please tick the option that is closest to your thoughts.**

|  |  |  |  |
| --- | --- | --- | --- |
| Items | Decrease | Unchanged | Increase |
| Total electricity consumption per month |  |  |  |
| Net electricity consumption per month (i.e. electricity consumed from the power grid company) |  |  |  |
| Household photovoltaic power generation per month |  |  |  |
| Household photovoltaic self-use electricity per month |  |  |  |
| Household photovoltaic grid-connected electricity per month (i.e. surplus electricity sold to the power grid company) |  |  |  |
| Your daily electricity consumption per month (daytime electricity consumption) |  |  |  |
| Your daily electricity consumption per month (nighttime electricity consumption) |  |  |  |

**8. Impact of the reduction of power generation subsidies on you:**

a. Basically no impact

b. Appropriate reduction in overall power consumption

c. Appropriate reduction in power purchased from power grid companies

d. Appropriate reduction in power generation

**9. The roof area of ​​your home is approximately:**

a. 40 square meters and below

b. 40-60 square meters

c. 60-80 square meters

d.80-100 square meters

e. Above 100 square meters

**10. The power of the photovoltaic power generation equipment installed in your home is approximately:**

a. 1-4KW

b. 5-9KW

c. 10-14KW

d. 15-19KW

e. 20KW and above

**11. The cost of installing photovoltaic power generation equipment in your home is approximately:**

a. 10,000-30,000 yuan

b. 30,000-50,000 yuan

c. 50,000-80,000 yuan

e. 80,000-100,000 yuan

f. More than 100,000 yuan

**12. For the installation of home photovoltaic, the highest installation fee you accept is:**

a. 10,000-30,000 yuan

b. 30,000-50,000 yuan

c. 50,000-80,000 yuan

d. 80,000-100,000 yuan

e. More than 100,000 yuan

**13. How long do you expect to recover the cost:**

a. 1-3 years

b. 3-5 years

c. 5-10 years

d. More than 10 years

**Part II: Concern for the Environment**

**14. Based on your common sense and cognition, please check the option that is closest to your idea:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | Items | strongly disagree | disagree | not sure | agree | strongly  agree |
| 1 | The current total population is approaching the limit that the earth can bear. |  |  |  |  |  |
| 2 | Humanity's destruction of nature often leads to catastrophic consequences. |  |  |  |  |  |
| 3 | Humans are currently abusing and destroying the environment |  |  |  |  |  |
| 4 | Plants and animals have the same right to survive as humans. |  |  |  |  |  |
| 5 | Human destruction of nature often leads to catastrophic consequences |  |  |  |  |  |
| 6 | If we act as before, it will lead to environmental disasters |  |  |  |  |  |
| 7 | I often get angry when I see media reports of environmental damage |  |  |  |  |  |
| 8 | I think everyone should contribute to environmental protection |  |  |  |  |  |

**15. Next, based on your daily purchase or use behavior, please check the option that is closest to your idea**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | Items | never | some  times | almost | always | frequent |
| 1 | To choose energy-saving lamps first when buying lamps. |  |  |  |  |  |
| 2 | To choose energy-saving home appliances according to the energy efficiency label. |  |  |  |  |  |
| 3 | To turn off the lights when leaving the room. |  |  |  |  |  |
| 4 | To cut off the power when the appliance is not used for a long time. |  |  |  |  |  |
| 5 | To set at 26-27℃ when using the air conditioner in summer. |  |  |  |  |  |
| 6 | Try to minimize the number of door openings when storing the food in the refrigerator. |  |  |  |  |  |

**Part III: Psychological Perception of Household PV Adoption**

**16. Compared with the use of traditional power systems, you think:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | Items | strongly disagree | disagree | not sure | agree | strongly  agree |
| 1 | I think using home solar photovoltaic power generation will have great benefits |  |  |  |  |  |
| 2 | It is a good idea to apply a home photovoltaic power generation system in my home |  |  |  |  |  |
| 3 | It will make me happy to apply a home photovoltaic power generation system in my home |  |  |  |  |  |
| 4 | If my colleagues apply a home photovoltaic power generation system, I will apply it |  |  |  |  |  |
| 5 | If someone around me (friends, relatives, neighbors, etc.) applies a home photovoltaic power generation system, I will apply it |  |  |  |  |  |
| 6 | If the village head uses photovoltaic power generation, I will also use home photovoltaic |  |  |  |  |  |
| 7 | If the news media advocates it, I will use home photovoltaic |  |  |  |  |  |

**17. Compared with the use of traditional power systems, you think:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | Items | strongly disagree | disagree | not sure | agree | strongly  agree |
| 1 | I have sufficient resources, knowledge and ability to use photovoltaic power generation system |  |  |  |  |  |
| 2 | Using photovoltaic power generation system is completely within my control |  |  |  |  |  |
| 3 | I believe I will apply photovoltaic power generation system in the future |  |  |  |  |  |
| 4 | I am familiar with home photovoltaic power generation system |  |  |  |  |  |
| 5 | I have a lot of knowledge about using home photovoltaic power generation system |  |  |  |  |  |
| 6 | Compared with others, I know more about home photovoltaic |  |  |  |  |  |
| 7 | Photovoltaic power generation system looks attractive |  |  |  |  |  |
| 8 | In terms of overall performance and attractiveness, photovoltaic power generation system is better than other conventional power generation systems |  |  |  |  |  |
| 9 | The application of photovoltaic power generation system is the trend of the times |  |  |  |  |  |

**18. Please select the option that is closest to your idea.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | Items | strongly disagree | disagree | not sure | agree | strongly  agree |
| 1 | I think the purchase cost of photovoltaic power generation system is higher than that of traditional electricity |  |  |  |  |  |
| 2 | I think the maintenance cost of photovoltaic power generation is higher than that of traditional electricity |  |  |  |  |  |
| 3 | I think the cost of using photovoltaic power generation (price per unit of electricity) is higher than that of traditional electricity |  |  |  |  |  |
| 4 | I think using photovoltaic power generation brings me economic benefits |  |  |  |  |  |
| 5 | I think using photovoltaic power generation is beneficial to society |  |  |  |  |  |
| 6 | I think using photovoltaic power generation brings more benefits to our industry and environment |  |  |  |  |  |
| 7 | I think using household photovoltaic power generation system is helpful to our country's energy transformation |  |  |  |  |  |
| 8 | I will recommend photovoltaic power generation to others |  |  |  |  |  |

**19. Please select the option that is closest to your idea.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | Items | strongly disagree | disagree | not sure | agree | strongly  agree |
| 1 | I think photovoltaic power generation is not always safe |  |  |  |  |  |
| 2 | Photovoltaic power generation has certain disadvantages in our society |  |  |  |  |  |
| 3 | I am very worried about the harm of photovoltaic power generation |  |  |  |  |  |
| 4 | Using home photovoltaic power generation can bring me income |  |  |  |  |  |
| 5 | The overall performance of the photovoltaic power generation system meets my expectations |  |  |  |  |  |
| 6 | Photovoltaic power generation can bring me great value |  |  |  |  |  |
| 7 | I hope to use photovoltaic power generation as much as possible |  |  |  |  |  |
| 8 | I will continue to use photovoltaic power generation systems in my life |  |  |  |  |  |
| 9 | I will recommend photovoltaic power generation to others |  |  |  |  |  |

**20. Regarding the subsidy policy for residential photovoltaic power generation, you think:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | Items | strongly  disagree | disagree | not sure | agree | strongly  agree |
| 1 | I think the policy of "for residential photovoltaic power generation projects put into operation after 2018, the on-grid electricity price is reduced to 0.55 yuan per kilowatt-hour (including tax)" meets my needs |  |  |  |  |  |
| 2 | I think the policy of "for residential photovoltaic power generation projects put into operation after 2018, the subsidy is 0.32 yuan per kilowatt-hour (including tax)" does not meet my needs |  |  |  |  |  |
| 3 | I think the policy of "projects can be included in the subsidy scope after grid-connected power generation" does not meet my needs |  |  |  |  |  |

**Part 4: Demographics**

**21. Your gender:**

a. male

b. female

**22. Your age:**

a. 18-25 years old

b. 26-35 years old

c. 36-45 years old

d. 46-60 years old

e. over 60 years old

**23. What is the highest degree or level of education you have completed?**

a. junior school and below

b. high school

c. bachelor’s degree

d. master’s degree

e. Ph.D or higher

**24. Are you married?**

a. yes

b. no

**25. Are you the head of the household?**

a. yes

b. no

**26. Where is your home located?**

a. rural

b. urban

**27. How many members in your family?"**

a. 1-2

b. 3-4

c. 5-6

d. 7-8

e. more than 8

**28. How many minor children are there in your family?**

a. 0

b. 1-2

c. 3 and above

**29. How many elderly people are over 60 years old in your family?**

a. 0

b. 1-2

c. 3 and above

**30. How many working people are there in your family (including those working in agriculture and self-employed)?**

a. 1

b. 2

c. 3 and above

**31. What is your annual household income?**

a. Less than 100,000RMB

b. 100,000 - 300,000RMB

c. 300,000 - 500,000RMB

d. more than 500,000RMB

**32. What is the number of household appliances in your household? (Please write down the quantity of each household appliance you own, if not, fill in "0")**

|  |  |
| --- | --- |
| Household appliance | Mumber |
| television |  |
| telephone |  |
| washing machine |  |
| refrigerator |  |
| water heater |  |
| air conditioner |  |
| computer |  |
| electric heater |  |

**Thank you very much for filling out this questionnaire!**