

## Projection of Solar Energy Consumers as Renewable Energy in Indonesia

<sup>1</sup>Fitria Avicenna, <sup>2</sup>Nufian S. Febriani, <sup>3</sup>Muhammad Shobaruddin

<sup>1,2,3</sup>Universitas Brawijaya, Malang, Indonesia

E-mail: <sup>1</sup>fitria.avicenna@ub.ac.id, <sup>2</sup>nufian.febriani@ub.ac.id, <sup>3</sup>shobar\_fia@ub.ac.id

**Abstract:** *In today's world, there is a shift from non-renewable to renewable energy sources. The potential of renewable energy, such as solar energy, has yet to be widely utilized, even though the renewable energy has considerable potential, especially in Indonesia. For this study, researchers obtained data on solar panel consumers through the official contact list website for potential consumers of the Ministry of Energy and Mineral Resources. Researchers obtained data through online questionnaires distributed to 207 consumers of products related to the renewable energy. Researchers use this sample because they are consumers or users of the renewable energy in the form of solar panels. In data presentation, data in the form of responses received from online questionnaires can generally show the demographic characteristics of the respondents. This research aims to formulate an effective promotional strategy by identifying consumer characteristics.*

**Keywords:** *Renewable Energy, Survey, Marketing Communication, Solar Power Plant*

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### INTRODUCTION

The government is currently under pressure to cut energy subsidies, which have absorbed a large part of the country's budget, and direct them toward building critical infrastructure. Therefore, the government is gradually eliminating fuel subsidies and changing electricity prices (Sunitiyoso et al., 2020). One of the impacts, due to changes in contributions made by the government, is felt by residents who produce palm oil in rural areas in Central Kalimantan as well as those who rely on diesel as a source of electricity. Those people require a stable source of electricity as subsidized diesel costs less and has limited use (et al., 2022). Meanwhile, Indonesia's population and economy are increasing the demand for energy and resulting in increased greenhouse gas

emissions. Currently, the government is implementing policy reforms to help reduce greenhouse gas emissions and encourage the use of renewable energy. However, unclear incentives, a history of subsidies, and conflicting policies hinder the achievement of subsidy objectives (Liebman et al., 2019). The economic crisis raises people's fears that there will be a collapse if there is no proper solution. The energy crisis and depletion of the supply of fossil energy sources accelerate the world to shift from non-renewable energy sources to renewable energy sources. Renewable energy potentials, such as biomass, geothermal, solar energy, water energy, wind energy, ocean energy, and hydropower, have yet to be widely utilized, even though this renewable energy has quite an enormous potential, especially in Indonesia. One

of the renewable energy sources with great potential in Indonesia is solar cells. The Directorate General of New and Renewable Energy has released data showing that solar energy has an extraordinary potential of 207.8 GW, while only 0.02% (0.135 GW) has been installed. The target until 2025 is 6.5 GW. Energy-related policies in PP 79/2014 and Presidential Decree 22/2017 support this target, showing the government's efforts to maximize the use of clean/renewable energy. Therefore, this study seeks to contribute to developing solar cell energy from the user side, namely potential consumers. Studies related to solar cell energy from the consumer side have begun, but more is still needed to describe the potential for its use in Indonesia. Preliminary studies show an institution's potential to utilize solar energy to build smart campuses (Kananda, 2017), and another study shows the suitability of solar energy for urban household needs (Kumara, 2010). Researchers have yet to find studies regarding consumer characteristics suitable for solar energy in Indonesia.

To support this urgency, USAID conducted a feasibility study for Solar Power Plants (Bayuaji Kencana et al., 2018) which stated that knowing potential customers is one of 5 (five) considerations in determining long-term Solar Power Plants development, namely PLTMH potential, land, technology, and electricity costs. This study aims to identify the characteristics of solar energy consumers so that it can formulate appropriate promotional strategy models. This study is one of the translations of RIP UB Renewable Energy. In particular, the topic of this study will complement studies related to the feasibility study of the potential of solar power from the point of view of Communication Science which is part of the roadmap until 2023. The Earth generates and stores thermal energy

(heat) as a renewable energy source called geothermal energy. Geothermal power plants generate around 90% of electricity. Even though Indonesia's geothermal reserves reach 40% of the world's geothermal reserves, this renewable energy has not been exploited on a large scale (Arafah et al., 2018). The world's power generation capacity will increase by more than 70% by 2030 due to the transformation of conventional energy to unconventional energy, which creates opportunities to develop renewable energy technologies to a stage where they are fully competitive with conventional technologies. We expect most of the increase in demand to occur in developing countries (Ambepitiya, 2015). As a country with a large amount of solar energy, it is hoped that there will be awareness among electricity consumers in developing countries to switch from conventional energy to solar energy. The number of renewable energy consumers in Indonesia still needs to be increased. Although the region can develop renewable technologies, they are reluctant to engage in energy conversion. Some people are reluctant to convert energy because fossil energy is still subsidized (Afriyanti, Sasana, and Jalunggono, 2020), coupled with the uncertainty of renewable energy technology. Understanding consumer attitudes towards innovative products, such as renewable technologies, can provide two main benefits. First, we can effectively identify and manage strengths and weaknesses in innovation attributes. Second, more control can be exercised on marketing strategies to create innovations that appeal to the most receptive audience (Ambepitiya, 2015). We can then use the marketing strategy to consider the process that individuals go through when deciding whether or not to adopt an innovation. However, product producers and marketers must overcome

the challenges posed by consumers because consumer behavior only sometimes manifests itself in the reality of consumption behavior (Ambepitiya, 2015). Still, from the same source, it is stated that producers must work together with “early” renewable energy users who are referred to as adapters, to develop the operational, economic, and aesthetic aspects of the product; suppliers must find out more deeply how to gain a greater understanding of what consumers perceive of renewable energy so that other potential consumers are willing to carry out energy conversions voluntarily.

Knowledge about the contribution of environmentally friendly products/services to environmental and individual health positively correlates with higher customer willingness to pay (Debra Indriani et al., 2019). Likewise, consumer perceptions of the effectiveness and greenness of renewable electricity will determine the costs incurred by green consumers (Kowalska-Pyzalska, 2019). So as a green marketer, it is necessary to develop a marketing strategy to attract green consumers who show caring ecological consumer behavior. The chosen marketing strategy must include innovation in the product, and consumers’ preferences to learn about products through marketing activities. We must communicate the personal value that consumers receive when using solar energy. Marketing strategy for green energy should convey a green message through information on price, innovation, technology, aesthetic benefits, and the product’s benefits. We must establish effective communication channels to convey this message. Thus, this message must speak precisely to its consumers about what the solar power industry wants to convey (Ambepitiya, 2015). A marketing and promotional communication strategy is needed to support the success of achieving the target

of renewable energy users in Indonesia. Worldwide, we need energy for economic growth, social development, and quality of life. Energy consumption grows at approximately 1% and 5% per year in developed and developing countries. Fluctuations in oil prices put pressure on the world economy, and the search for alternative sources of clean energy is a priority for many developed countries (Nurcahyanto et al., 2020). In 2015, renewable energy accounted for 19% of the total global energy demand. The transition to renewable energy worldwide started from a critical international turning point on climate change with the adoption of the Kyoto Protocol in December 1997. A landmark agreement was reached in Paris in 2016 to combat climate change within the United Nations Framework for Climate Change (UNFCCC). The long-term goal of the Paris Agreement is to keep global temperature increases well below 2 Celsius by accelerating and intensifying the actions and investments needed for a sustainably low carbon future. As of November 2019, 195 UNFCCC members have signed agreements (Abu-Rumman et al., 2020).

Cooperation is needed to resolve obstacles that arise during the energy conversion process. These obstacles can be in the form of economic and financial barriers, policy and regulatory barriers, educational and technology, and other obstacles. Technological barriers relate to the growth and development of the solar electric utility sector or the solar rooftop segment (Rathore et al., 2019). To carry out consumer projections and formulate solar energy promotion strategies, user identification or demographic, geographic, and psychographic analysis of the target or potential consumers of this type of renewable energy is required. One of the promotional activities commonly used because of its effectiveness is advertising. The results of the previous

research can mention advertisements that can attract potential consumers to use products and even direct them to use certain products or services based on the information contained in the advertisement and the way it is conveyed to the public (Fandeli, 2018). The first goal of an advertising message is to get “attention”, known as the cognitive phase. Promotional messages must perform this procedure properly to be seen or heard effectively. There are various ways to grab the attention of customers including big titles, controversial or shocking content, such as pictures of handsome people like children, or special effects to attract attention or stand out (Sharifi et al., 2019). The mass media has a significant impact on attracting the audience’s attention. In the “interest” stage, the customer is emotionally impressed. To do this, the tone of the advertisement and message needs to be proportional to the experiences and attitudes of the target customers (Fachruddin, 2019). In addition, the advertising must have appropriate language, good layout, and accurate content. At the “want” stage, to communicate well with target customers, advertisers need to know how they think. Then, the advertising must convince customers that the products/services introduced can satisfy their needs. Finally, in the “action” stage, the advertising forces the customer to buy the product/service. Even though the purchase is not the ultimate goal, the positive impact on the purchase is substantial because it can show the positive influence of promotion on the purchase decision. If customers cannot purchase an offer in an advertisement, they will make it available as soon as possible (Paço et al., 2019). According to the AIDA model (Attention, Interest, Desire, and Action), the advertising is effective when it can direct customers from the first stage to the last stage. Utilization of solar home systems, wind

turbines, biogas digesters, and gasifiers will increase living standards (Paço et al., 2019). Solar energy is one of the cleanest renewable energy sources with a wide range of applications worldwide. Solar panels harness the sun’s energy, and households can use it to generate electricity and heat water. We divide solar energy into three categories: solar thermal or cooling/heating systems, photovoltaic systems that directly convert light rays into electricity, and solar thermal power systems that convert solar energy into power through heat-producing electrical equipment.

Empirically, researchers have yet to find some researches that use the AIDA model to predict the public’s intention to adopt renewable technologies. Only a few studies implicitly address some of the model’s components in the energy sector. Some of these concentrate on the attention component (customer awareness and knowledge of existing technology). Sovacool (Sovacool, 2013) assesses the factors influencing the implementation of renewable energy programs in Asian countries, such as China, Mongolia, Indonesia, India, and Sri Lanka. He stated that several countries had succeeded in implementing the program. He concluded that factors, such as technical standardization, marketing and awareness, stakeholder engagement, capacity building, financial, political leadership, revenue generation, appropriate technology, and flexibility are effective ways of implementing the program. Civil society stakeholders in Tunisia provided a conceptual model of their attitude toward promoting renewable energy through Theory Action Research (Akermi & Triki, 2017). They argue that environmental concern, ecological awareness, and ecological behavior interact are the main antecedents of renewable energy knowledge. Furthermore, knowledge about renewable

energy, in turn, influences beliefs about its consequences. In addition, public beliefs and evaluation of consequences are critical determinants of attitudes toward action, namely using RET. The TPB (Theory Plan Behavior), an advanced version of the technology acceptance model, is used to test the adoption of renewable energy among consumers in Pakistan. This study investigated the factors influencing consumer intention to utilize Renewable Power Generation Technologies (RPTs) for household use in Pakistan by introducing factors influencing the lack of access to electricity in remote areas (Jabeen et al., 2019). The study results reveal that subjective norms, attitude constructs, relative advantage, perceived behavioral control and lack of access to electricity positively influence consumers to utilize RPT in Pakistan. They concluded that all variables, except subjective norms and knowledge, significantly impact the intention to use renewable energy. Ding and Zhou in China, for example, developed a RET (Renewable Energy Technologies) adoption model in the form of support to encourage RET (Ding et al., 2020). A dynamic programming model created optimal policy support for RET in the study to obtain optimal policy support for RET so that further policy efficiency improvements are needed to make technical changes to RET development.

## **METHOD**

This research consists of several stages. We collect critical information about potential objects in research using various reference sources to carry out the first stage of pre-research activities. The pre-research process was carried out by observing problems in the field, formulating problems, developing frameworks, mapping concepts, determining methods and techniques for data analysis, and preparing proposals.

The second stage is an in-depth literature study and preparation for data collection obtained from: Data on the number of users and potential areas for renewable energy obtained from the IESR research institute; A research report from the Ministry of Energy and Mineral Resources; Some of the results of previous studies are relevant to the research topic. This in-depth literature study aims to obtain more initial data and information about the research topic, broaden and limit the scope of the research topic, and familiarize the researchers with various terms, vocabulary, and phrases used in the research. The third stage is data collection. Data were collected using questionnaires distributed through various media, such as social media and WhatsApp. The sampling technique used is probability sampling - purposive sampling with the condition that they are Indonesian citizen/ citizens and Indonesian domiciles so that the conditions genuinely reflect those in Indonesia. We obtained data by utilizing an online questionnaire survey adopted from previous research and distributing it to 207 consumers of products related to renewable energy. We chose this sample consumer because they use renewable energy in the form of solar panels.

Consumers and researchers helped conduct trials for questionnaire items. We emailed an online survey questionnaire to consumers after the trial. The responses received in total can show the demographic characteristics of the respondents. We will summarize the data in tabular form in the presentation. The fourth stage is the data processing and empirical analysis involving items on the questionnaire for the survey. An initial version of the questionnaire was distributed among customers of renewable energy products to get their opinions on renewable energy. We made several modifications to the survey questionnaire, which now has 16 items. All items use a two-point Guttman

scale: agree (score 2) and disagree (score 1). This study involved four questions in the questionnaire, including those related to demography, general knowledge regarding RE (Renewable Energy) and Solar Power Plants product knowledge, and interest in using it. Variables measured/observed: see the effect of product knowledge (X) on interest in using PV mini-grid (Y) with the primary objective: Obtaining clarity (descriptive studies), whether the research results are generally accepted, in determining the sample, researchers need to be careful because the research sample taken must be representative and then make predictions using a regression measuring instrument. Data analysis uses the following procedures: collect, process, and translate data into a form that readers can understand using data visualization. The tools used in this data analysis are Excel and SPSS version 26.

## RESULTS AND DISCUSSIONS

This section will begin with an explanation of the demographic results and general knowledge of respondents regarding RE and Solar Energy. Age of the respondents, 85% are 18-35 years, and of the gender respondents, 70% are women.

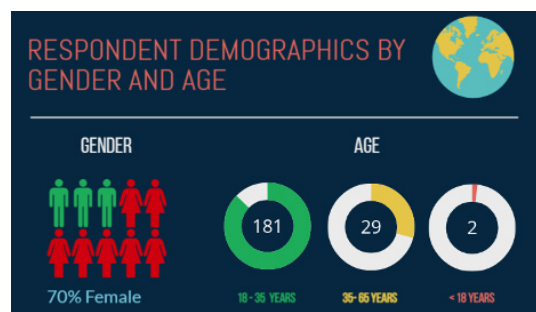


Figure 1. Respondent Demographics by Gender and Age

As shown in Figure 1, most of the respondents in this study are women; this shows that women have a higher awareness of new and renewable energy products, especially solar panels.

Respondent Demographics by Gender and Age also shows that women have high awareness apart from the topics of health, sexual violence, education, and children (Wogu et al., 2019). This data becomes a marketing communication strategy to start promoting the use of renewable energy in Indonesia, especially solar panel energy, by targeting women as marketing objects. 70% of these women are in the age range of 18-35 years. This age shows that the category of late adolescents (17-25 years) and early adults (26-35 years) has a high interest in energy topics (Febriani & Avicenna, 2022). This Respondent Demographics shows that the level of support for energy, in this case, solar energy, is correlated with age. The 18-35-year-old group has higher product awareness than the 35-65-year-old group and less than the 18-year-old group. In terms of gender, there are differences between women and men in the level of awareness to support renewable energy in general or certain forms of energy. Gender is the variable most frequently included in survey research although it appears to be the least important factor. However, from most research records, women are more likely to oppose fossil fuels, but more likely to support renewable energy. There is a positive relationship between consumers of renewable energy who are willing to pay and variables, such as income, willingness to invest in energy-efficient equipment, and individual energy efficiency. From the research results, researchers can study energy users, taking into account the characteristics of demographic variables, such as gender, age, and education in the context of willingness to use new renewable energy, such as solar panels.

The negative correlation is the willingness to use new energy and its price. An important factor, in this case, is the respondent's age. In this study, people under 35 – 65 years are more willing

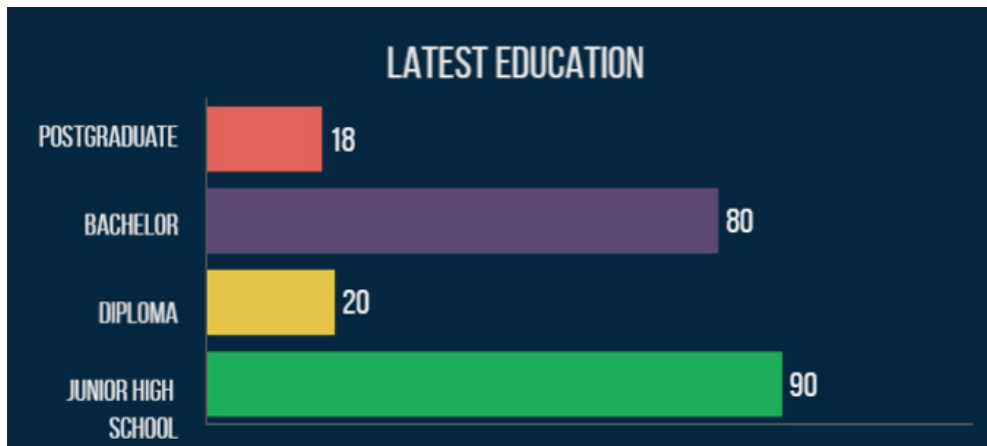


Figure 2. Respondent Demographics based on Latest Education

to pay than younger people and many renewable energy users. Even though the actual benefits of renewable energy are the same in all countries, the character of renewable energy consumers in each country is different. In comparison, researchers from Spain confirmed that the willingness of renewable energy consumers to pay is associated with past negative experiences of energy supply outages; level of education as a more significant expression of concern for greenhouse gas emissions; and those who exhibit energy-saving behaviors (Ropuszyńska-Surma & Węglarz, 2018). The same thing also happened in Indonesia. In addition to women aged 18-35 years being the majority respondents in this study, researchers found that respondents have different levels of knowledge about products and the use of renewable energy. This difference arises because of the various levels of education of the respondents.

In Figure 2, the educational background of the majority of respondents is Junior high school and Bachelor's degree. This Respondent Demographics based on the Latest Education is one of the essential factors for formulating a promotion strategy for specific products, such as solar panels. Respondents at this level of education require more attention regarding information, benefits, drawbacks, risks, prices, and related

product/service information. As revealed from the results of previous research on socio-economic variables and energy awareness, the opportunity to make decisions about the use of renewable energy is relatively greater when household decision makers have at least junior high school or senior high school education, with a high school education background having a greater chance than junior high school. (Ropuszyńska-Surma et al., 2018). Through the respondent's education data, researchers can include education as the main determining factor in market segmentation criteria so that future researchers can include socio-economic variables based on gender, age, and level of education. At the educational level, those with high school/vocational school and undergraduate backgrounds have high awareness and interest in using solar panels as an alternative energy in their homes. However, this level of awareness and interest must support the technical capability of installing solar panels through other media.

The problem with this educational group is that they need the technical and financial means to install solar panels. Households with educated decision-makers in this group tend to install solar panels in their homes because they have technical and non-technical knowledge about installing solar panels. As mentioned in the introduction, this

research aims to explore the profile of households who wish to install solar panels. Households with the highest willingness to install solar energy are those with the characteristics of women who act as decision makers aged 18-35 with high school/vocational school education and Bachelor's degree. People with an educational level who understand technical issues use LED lighting and energy-saving appliances more than those who do not (Education lower than senior high/high school) (Ropuszyńska-Surma & Węglarz, 2018). People with higher education than high school tend to purchase household appliances that are more energy efficient. In this study, the character of consumers who understand technically is at the Diploma level. However, only a few indicated that they were more enthusiastic about using solar panels than those at the High School and Undergraduate level. A higher percentage of people in the segment who need to be more technically savvy are almost always in favor of environmental sustainability. An example of this behavior is turning off the electrical equipment. The difference between technical and non-technical intelligence is challenging to distinguish, and the difference in technical ability to use renewable energy lies in a person's educational level. People with high school education are more sensitive to environmental aspects than people with engineering education, but this needs

further research.

Respondents with Bachelor's level of education also demonstrated environmentally friendly behavior. What distinguished this educational group from senior high school was the benefits they were looking for in education. For Bachelor degree background, they use solar panels to get energy security. Meanwhile, for high school background, they aim to satisfy their needs. The data shows more conformity behavior in respondents, and only respondents in the Senior High School group could be slightly disadvantaged by being environmentally friendly consumers. Then, there is a relationship between household decisions to use solar panels with explanatory variables, such as gender, age, and type of education. End-user segments are identified based on the following determinants: Gender, age, and education. The characteristics of the user segment are shown in the survey through questions about the behavior and attitudes of the respondents, such as the reasons for installing or not installing solar panels, the driving factors for not being an environmentally friendly consumer, and the advantages and disadvantages of being a renewable energy consumer. Furthermore, researchers also mapped the respondents apart from the educational factor. As seen in Figure 3, in almost all islands in Indonesia, solar panels are installed and utilized by the community.

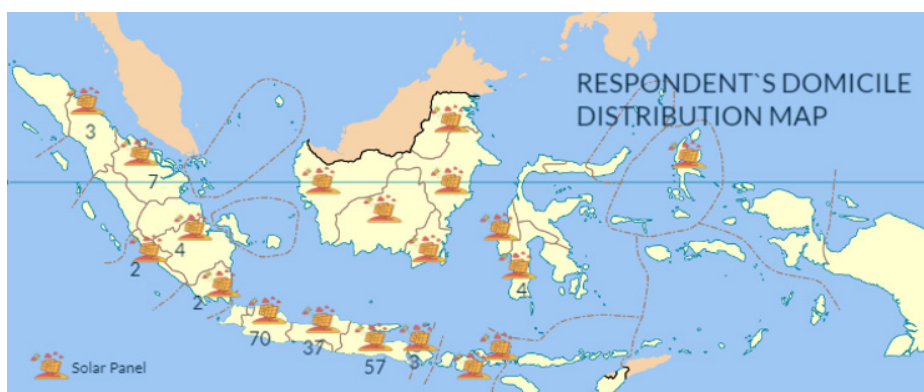


Figure 3. Respondent Demographics based on Respondent's Domicile Distribution Map



Respondents' domiciles included 37% West Java, 29% East Java, 19% Central Java, and the rest varied. The results add new insights into the scientific debate about the global energy transition by identifying areas of solar use and innovation gaps in the use of the technology. Electrical energy is emerging as a critical area that offers synergies between efficiency and renewable energy. In other words, we require integration of renewable energy in society as a usable electric power system. Renewable energy can replace fossil energy, which has been used continuously with benefits in terms of efficiency and economy. Currently, the states and businesses can utilize business opportunities for solar panels, and a new business model can produce a distribution map of solar panels based on respondent data. There needs to be a combination of new markets, promotion and marketing design, price, time, and place of use that are more appropriate to target consumers. The different characteristics of each region make the character of consumers in each region different. Special treatment is required so that consumers can understand the marketing and promotional messages conveyed. Using a message strategy targeting women aged 18-35 in every region in Indonesia requires an approach beyond

just campaigning for renewable energy. To increase consumers' willingness to pay for and install solar energy through solar panels, marketers need complete data on the consumption habits of these target groups in each region to maximize the results. Through this research, the awareness and interest in using solar panels in Indonesia are pretty even, and the interest is relatively high.

Mobilizing finance for investment and innovation in low-carbon energy is a significant challenge for climate change mitigation. Various sectors need to be involved, including potential users of new and renewable energy. The use of solar panels requires relatively large initial capital so that the socio-economic factors in this study are relevant to explain the relationship between consumers' willingness to pay for renewable energy and the long-term benefits they will receive. Figure 4 shows an analysis of the respondents' socio-economic factors that influence consumers' willingness to pay for solar energy. The figure shows that the respondent with the highest monthly expenditure is less than IDR 5,000,000 but not less than IDR 1,000,000. These figures show that respondents receive higher than the Provincial Minimum Wage standards set by the government in 2022 for 34 provinces in Indonesia.

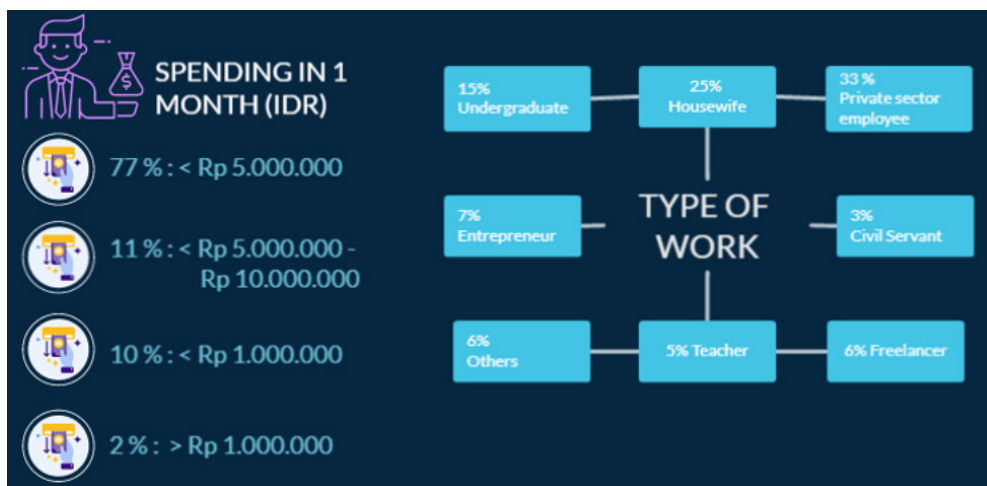


Figure 4. Respondent Demographics based on Spending in 1 Month and Type of Work

Each province has a certain amount. The average wage is between Rp. 4,000,000 to Rp. 2,000,000. Researchers do not use income per month or year to measure respondents' financial ability level but use expenses every month. The assumption of spending each month is that if the respondent can spend an average of less than IDR 5,000,000, then the income earned is at least greater than or equal to IDR 5,000,000. The monthly expenditure figures obtained in this study show that respondents earn an average income above the regional minimum wage for each province. This financial capability makes private employee respondents a potential target for solar panel users. This group economically wants to benefit from using solar energy as shown in the portfolio of companies producing solar panels. Respondents want an energy supply. The energy system used can increase energy security and product innovation. If this portfolio is good, most potential customers will consider installing solar panel products in their homes. Another important factor is price; if the income level of private employees makes it impossible to buy solar panels, then there will be no increase in the use of solar energy. Income is one of the determining factors for the use of renewable energy; this is in line with previous research which states that income, costs, building characteristics, location, and weather affect energy use in the housing sector (Amelia & Kusumawanto, 2021). The main obstacle that prevents respondents from using solar panels is in the context of low-income and middle-income communities.

Geographically, Indonesia is a tropical country with two seasons which allows the maximum use of solar energy compared to other countries with four seasons. This unlimited potential source of solar energy requires adequate capabilities and skills in management

and inadequate infrastructure, especially from the household or respondent's building side. Many previous studies have concluded that people with middle economic levels primarily depend on fossil energy (Murshed, 2020). Respondents in this study (with a monthly expenditure level of IDR 5,000,000) denied the results of the research presented earlier; respondents are willing to pay for the use of environmentally friendly energy, such as solar panels if the government reduces tariffs and resolves trade barriers for renewable energy products to meet demand. Still related to consumers for types of renewable energy sources, in high-income countries, trade openness and energy consumption encourage consumers to always tolerate upper limits on the use of fossil energy before finally starting to use renewable energy. Still, in low- and middle-income countries, there are trade openness and more renewable energy consumption (Murshed, 2020). If looking at the type of work of the respondents, most of them are private employees; their interest in using solar panels is relatively high because they also come from a group of respondents with a higher level of education (Senior High School and above). This interest can lead to purchasing decisions if it is driven by campaign messages, either through continuous advertising or training. With the number of respondents with an average expenditure of less than IDR 5,000,000 per month, respondents fall into the category of potential consumers of new renewable energy products of the solar-type. The use of solar panels can meet the needs of household electricity supply in Indonesia because the average electric power is 900 VA. As shown in Figure 5, most of the respondents in this study had 900 VA and 1,300 VA household electric power. This amount encourages consumers to look for additional energy alternatives in two ways. The first way

is to use fossil energy, as has been used so far, and the second is to use new, renewable energy, such as solar panels, to meet their daily energy needs.

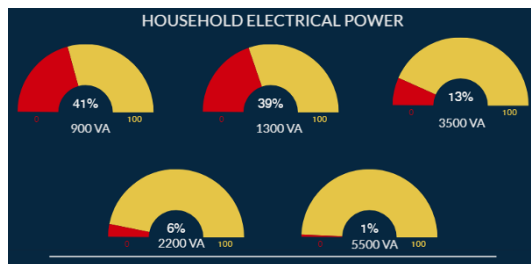


Figure 5. Respondent Demographics based on Household Electrical Power

The power usage of 900VA for households is considered insufficient for everyday use. Thus, renewable energy technology products are an alternative for respondents to meet their energy needs. Solar panels, affordability, sales, and after-sales service are the main factors for respondents to buy this energy. Several households have installed solar panels, starting from fossil energy of 900 VA. Adding solar energy is a form of adopting renewable energy technology so that researchers can identify the model of service behavior shown by respondents. This model has an essential role in the energy transition towards a cleaner energy system in terms of the environment and human health. Previous researchers stated that the household transition model that uses fossil fuels is currently shifting to the accumulation of fossil fuels to meet all household needs (Harrington et al., 2020). This model shows that households have a lot of electrical energy needs so that 900 and 1300 VA cannot be fully used to meet household electricity needs. It predicts that the energy consumer group will gradually add equipment and capacity according to their needs as the income increases. The effect of demographic variables on the energy transition can provide an overview for future researchers about the gaps in energy access that arise in society. As for households, the use of electrical energy is multidimensional because they often

rely on using several fuels at once. The following section is an explanation of the general knowledge of the respondents regarding RE and Solar Energy. As many as 90% of respondents have heard the term RE. Of the types of RE respondents, 50% know only solar energy, 23% know solar energy and biogas, and 16% know the types of solar energy, biogas, and micro hydro. Regarding socialization, 61% of respondents felt they had heard/seen RESocialization. 85% of respondents have heard/seen/read news about RE development. Respondents said that 25% of RE users in their environment were their workplace, 17% were friends, 14% were relatives, and 7% were themselves. 61% of respondents have never worked or are currently involved in RE. 83% of respondents are not Solar RE users at home. 75% of respondents have received information regarding Solar RE. 64% of respondents are actively seeking information about Solar RE. Respondents actively seek information about Solar RE, 36% through social media, 22% through news portals, 16% through search engines, 13% through seminars, and 13% through outreach.

The characteristics of Solar RE, according to respondents, are environmentally friendly (95%), saving PLN electricity (89%), easy to use (80%), guaranteed security (78%), and easy maintenance (66). The results of product knowledge questions show that more than 90% of respondents agree that solar energy at home will produce better environmental changes, panel technology (solar energy) with SNI certification is of good quality, electricity costs are more economical, and solar energy users are good role models for the environment. However, only 69% of respondents feel that panel technology (solar energy) is easy to find in stores, both online and offline. Furthermore, it is a survey about consumer interest in using Solar Power

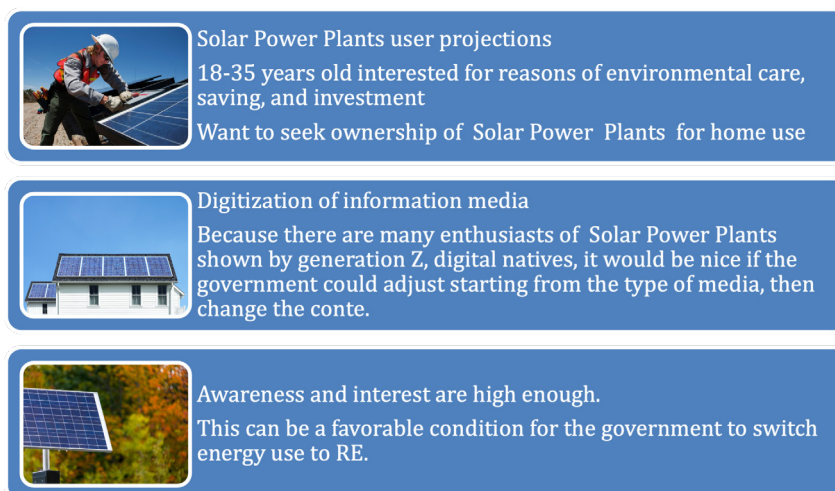


Figure 6 Projections of Renewable Energy Consumer Behavior in Indonesia

Plants., respondents are interested in using panel technology (solar energy) at home for reasons of investment (80%), economical (87%), and environmentally friendly (92%). 77% of respondents try to realize this interest by making more efforts (e.g., saving money, social gatherings) so that they can buy panel technology (solar energy) and use it at home. 90% of respondents would also recommend other people join in using panel technology (solar energy) in their homes. The regression test results of the product knowledge variable (X) on interest in using Solar Power Plants (Y) show a significance of 0.00 with a correlation/relationship (R) value of 0.643.

## CONCLUSION

This study concludes that the character of enthusiasts/prospective users must be used as a reference so that information can be accessed quickly and the application of renewable energy transfer can minimize problems. The model that we propose prioritizes 3 points, namely the projection of Solar Power Plants users is the generation Z with the motivation of caring for the environment, saving, and investing. They are a group interested in pursuing Solar Power Plants ownership for home use.

Second, generation Z feels that digitizing information media is essential because many solar panel enthusiasts come from this generation, digital natives; it would be excellent if the government could adjust it, starting with the type of media, then adjusting the content. Third, awareness and interest are high enough. That is, this can be a favorable condition for the government to start the transition from energy use to RE. Through the results of this study, environmental campaign advertisements can use demographic data to develop creative message strategies according to the characteristics of the respondents in this study to approach the audience and get positive results; also place an emphasis on good neighborly relations and long-term savings. Advertisements or campaigns must also refer to women's expertise in this segment, and advertisements and other promotional tools may refer to technical knowledge of renewable energy installations. If the local government seeks to increase the share of renewable energy on a small scale regionally, the contribution from households must be a concern. Their acceptance and willingness to install renewable energy is essential in increasing the share of renewable energy installations, especially solar panels. The research results can also assist in

the formulation of social campaigns to overcome reluctance to install renewable energy through educational training to overcome lack of knowledge and to demonstrate the financial efficiency gained, as well as to develop a clear and effective subsidy system since financial and economic aspects are the most important factors for Indonesian people.

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