Factors Affecting Consumers' Interest Towards Net-Metered Solar Photovoltaic Technology in Batangas Province

Leizel P. Jandusay[a]

[a]leizelpadua@gmail.com

College of Business Economics Accountancy and Management, De La Salle Lipa

Lipa City, Batangas, Philippines

Abstract

Net metering constitutes noteworthy financial motivating forces for clients who utilize distributed energy assets to look for their own power source since it plays an important part in reducing their power bills by starting to use renewable energy. The objective of studying the factors affecting consumers' interest in net-metered solar photovoltaic (PV) technology in Batangas Province was to identify the relationships between consumers' interest in net-metered solar photovoltaic technology and the independent variables of the study, specifically investment, technological capability, tariff structure, regulatory concern, and consumers' demand. Issues to address include increasing settled monthly costs for residential customers and bringing down the charge per kWh would permit costs to be recuperated in any case, no matter how much control is charged. This technique would lead to higher monthly bills for lower-income customers and those utilizing less power. Respondents were three hundred eight (308) utility customers in the province of Batangas served by BATELEC I and BATELEC II. Data were collected using survey questionnaires gathered through a purposive sampling method. The study determined if investment, technological capability, tariff structure, regulatory concerns, and consumer demand can affect the consumers' interest in net-metered solar PV technology. Results show significant positive relationships between consumer interest and factors such as investment, technological capability, and tariff structure, while negative relationships exist between consumer interest, regulations, and consumer demands. The research proposes that utility companies have community solar programs. The objective is to promote net-metered solar energy consumption by organizing workshops and training through partnerships, promoting the patronage of solar photovoltaic energy.

Keywords: Photovoltaic Solar Technology, Net-Metering Program, Renewable energy

I. INTRODUCTION

A. Background of the Study

The global population increase and technological improvements have dramatically increased energy demand (Rezvani et al., 2022). As a result, the issue of energy demand needs to be taken seriously. Another energy source will be needed to tackle this issue because fossil fuel reserves will run out in around 100 years. Environmental issues caused by the burning of fossil fuels include the emission of greenhouse gases, air, soil, and water pollution, widespread climate change, global warming, rising sea levels, and the extinction of some plant and animal species. The creation of radioactive waste and the possibility of accidents provide a difficult safety challenge for nuclear energy, however. In such cases, renewable energy sources, which are abundant in every climate and are very environmentally friendly, have emerged as a viable choice for sustainability and energy supply.

Even though technology has improved faster than ever, the majority of nations have relied primarily on fossil fuels to provide electricity. Over 70% of the rising global energy demand is made up of fossil fuels, such as coal and oil. According to scientists, the

primary human activity that has been contributing to global climate change is the ongoing use of non-renewable energy sources like coal and natural gas for the production of electricity (Lau, et. al. 2020).

Further, despite the fact that the integration of renewable energy generation into traditional electrical networks is still up for debate, its development potential to satisfy rising electricity demand cannot be discounted for technological or socioeconomic reasons. Kumara and Mahakalanda (2019) stated that meeting emerging nations' rising demand for power continues to be difficult. Wind, concentrated solar power, and other low-carbon energy technologies are seen as the most promising ways to produce renewable energy. The idea and feasibility of generating solar power domestically through net-metered solar photovoltaic (solar PV) systems can be highly attractive as a means to encourage the adoption of cost-effective power generation sources and decrease dependence on fossil fuels.

In order to reduce global warming, the globe needs to adapt to renewable energy sources (Ahmed, et.al. 2019). An example of renewable energy that is increasingly in usage is solar electricity. With a favorable growth rate of 33% yearly, the installed capacity of solar PV has reached 303 GW globally as of today (Ahmad et al., 2019). Solar technologies are predicted to account for up to 45% of national energy generation in the United States while occupying a maximum land area equivalent to 0.5% of the contiguous United States surface and just 10% of appropriate disturbed areas (US Department of Energy SolarEnergy Technologies Office, 2021).

By 2023, solar energy is anticipated to meet 4% of the world's electricity needs. Solar energy is still expensive compared to other energy sources like wind power and fossil fuels, despite years of development and recent drops in solar panel prices (Ranjith, 2018).

In the context of an energy system, Enet is frequently stated as energy return on energy invested (EROI). Electricity generation from renewable energy sources such as wind and solar PV has been found to have a reasonable EROI while emitting minimum GHG emissions (Raugei et al., 2018). As a result, they are seen as essential participants in the majority of future low-carbon emission scenarios (Diesendorf and Elliston, 2018).

Renewable energies are crucial to future energy supply, therefore the estimated scale at which they must function is massive (Daaboul, et. al. 2022), necessitating massive amounts of materials and land area per unit of electricity produced (Pratiwi and Juerges, 2020). As a result, while selecting a low-impact RE technology for a specific site, the environmental implications from non-GHG sources should be carefully evaluated. To have the least environmental impact, all toxins must be cleaned up and the impacts generated per kWh of energy produced must be addressed; this is known as ecosystem maintenance. More research is needed to determine which RE generation solutions have the highest net energy production while also having the lowest overall environmental impact (Sanchez-Zapata et al., 2019).

Guangul and Chala (2019) claimed that in spite of the fact that solar energy is essentially limitless, just a small portion of the world's current energy needs comes from this source. In any case, it frequently undergoes rapid development and is motivated by the global effort to make energy advancements in order to address and alleviate climate change. The world's nations and businesses are currently investing substantial sums of money in solar energy. Lim, et. al. (2020) on the other hand, believed that solar energy will eventually rank among the major sources of energy in the world due to its endless and free energy source, simple accessibility, quiet operation, advances in research, falling costs, and environmentally friendly low-carbon lifespan.

The Philippines' pioneering solar net-metered community has been launched at the Via Verde subdivision in the city of Trece Martires, Cavite. The residential houses within the community include solar net-metering, producing their own power while sending out excess energy to the grid in exchange for electricity charge credits. The project is expected to contribute to a more stable electric grid

throughout the major island of Luzon. The Philippines' Energy Regulatory Commission's net-metering programs enable solar panel owners with under 100 kilowatts of peak capacity to sell their excess electricity generation to the national grid for power bill credits (ICLEI, 2022).

The following are the advantages of net metering to customers. To start with, the system is incredibly essential and requires no movement on the part of the solar system proprietor after starting the foundation. Net metering offers genuine regard for an abundance of energy without any additional foundation or other expensive capacity systems. It serves as a way for property holders and businesses to contribute energy and evacuate much of the weight from the network. This may be particularly true in the midst of the best utilization periods. Third, with net metering, one solar-equipped residential home can fundamentally control some other homes. On a larger scale, neighborhoods using solar systems appear to have become self-sufficient. Fourth, it offers customers an essential but successful part to play in elective energy generation: without doing anything particular, solar installers can offer help to guarantee the environment and secure characteristic resources. Finally, homes utilizing net metering tend, overall, to be more careful of energy utilization.

Most solar power systems are "grid-tied." This implies the solar system can possibly send power to the utility grid when the domestic or agricultural system is utilizing less control than what is expected. When solar was introduced, the system on the side of the meter was interconnected. As an unused proprietor of a little control plant associated with the grid, the "interconnection" rules given by the neighborhood electric utility must be followed. The most prominent advantage of net metering for solar homeowners is the utility charge investment fund. Net metering can result in tens of thousands of dollars in investment funds over the lifetime of your sun-oriented panel system (SolarReviews, 2022).

Net metering is one of the critical incentives for property owners to contribute to solar panels. The essential good thing about net metering is that it saves hundreds of pesos on utility bills each year. During the lifetime of solar panels (usually up to 30 years), you can save thousands of pesos by cutting power utilization from the control grid. The challenges associated with establishing Net Metering Facilities (NMF) further complicate the implementation of innovative energy systems, especially for decentralized periods such as solar PV. The existing power markets are predominantly structured to accommodate centralized power plants and operate within rigid constraints, which can limit the integration of power generated by decentralized sources.

The Energy Regulatory Commission (ERC), through Resolution No. 06, Arrangement of 2019, embraced the corrections to the Rules Empowering the Net-Metering Program for Renewable Energy ("Net-Metering Rules" for brevity). The Net-Metering Program empowers a standard power buyer to end up a "prosumer". As a consumer, the standard power customer produces power for its claim utilization as well as offers any abundance to the dissemination network. The Net-Metering Program could be a non-fiscal incentive ordered by the Renewable Energy Act. To execute this motivating force, the ERC declared the Net-Metering Rules as early as 2013. During the implementation of the 2013 Net-Metering Rules, significant concerns were raised by stakeholders (ERC, 2022).

Solar net metering could be a utility charging instrument that gives private and commercial clients credit for the control they are sending back to the grid. In other words, the excess power delivered by the solar panel systems is sent back to the grid. In this way, customers have to pay only for the net energy used. Without solar net metering, the additional solar energy produced through panels is sent to the grid and would receive nothing in return. With net metering, on the other hand, the utility company pays for the solar electricity sent to the grid. Utilities regularly compensate by actualizing an energy credit to the electric charge for each kilowatt-hour (kWh) of solar control sent to the grid. Net metering credits are then used to compensate for any energy taken from the grid when solar panels are

not generating electricity, such as after the sun has set. It allows for the full economic value of all of the solar energy produced by panels (Waaree, 2022).

More grounded and clearer courses of action are required to push for net metering as another choice to urge renewable energy advancement inside the country, concurring with the beat official of Energy Development Corp. (EDC). In a webinar organized by the Ecumenical Movement Gathering on Tuesday, EDC president and COO Richard Tantoco said there's a need to come up with more grounded approaches for the net metering program to inspire great determination among control clients. Under Republic Act 9513, or the Renewable Energy Act of 2008, the net-metering program permits control clients to present an RE office inside their premises up to a capacity of 100 kW, and any wealth control not eaten up is exchanged to a DU, and in return, the client is compensated through credits in their monthly charge. As an example, he said that in the National Capital Region, the rate of excess electricity generated from a household's solar rooftop is only P4 per kilowatt-hour, whereas consumers pay P11 per kWh for electricity from the grid. (Rivera, 2021).

Pros of net metering: Possibly the most prominent great thing about net metering is the cost-saving potential for contract holders who utilize sun-based panels. But there are certainly other central focuses, such as reducing the demand on the grid. Once solar power is contributed back to the grid, less ought to be pulled from nonrenewable energy sources. That can make the nearby grid steadier and more welcoming. What's more, since the energy is made locally, it is engaged to create a differentiation inside the environment by diminishing the carbon impression that comes with transporting those nonrenewable energy sources into the community from someplace else. Increase control over utility bills. As people become more aware of the vitality being basically utilized, they become more cautious about it. Incredible stewardship of parcels can offer help to the environment as well as diminish utility bills. Decrease the payback period. Net metering programs make the prospect of contributing to the finest sun-based boards much more appealing to property holders since they can definitely diminish month-to-month bills. As a result, it ought to be able to recover the beginning solar panel speculation much sooner than on the off chance that it does not take advantage of a net metering program. For example, the normal payback period for standard private solar boards in New Jersey is four to five years; in differentiation, the payback period in a state without net metering approaches can be more noteworthy than 10 years.

This study aimed to analyze the factors affecting consumers' interest in net-metered solar photovoltaic technology in Batangas Province and promote net-metered solar energy consumption through organized workshops and training. This study may benefit electrical utility consumers upon realizing the benefits that net-metered solar energy may bring them.

B. Research Frameworks

Conceptual Framework

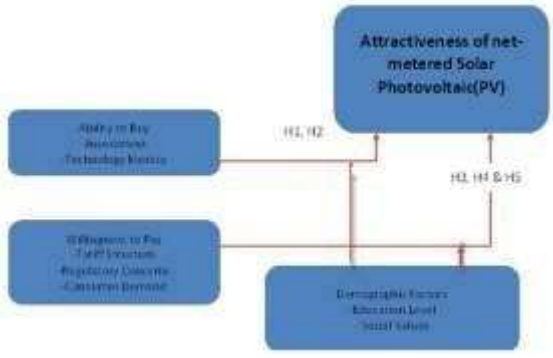

Figure 1. Conceptual Framework

The conceptual framework of the study is anchored on the study of Kumara and Mahakalanda (2019) entitled "Factors Affecting Consumer Attractiveness Towards Net-Metered Solar PV Technology in Sri Lanka."

In their study, the relationships among the independent variables – investment, technology literacy, tariff structure, regulatory concerns, consumer demand, education level, and social values; and the dependent variable – the attractiveness of net-metered Solar PV were tested.

After gathering, interpreting, and analyzing the data, they were able to identify that positive relationships exist between attractiveness and independent variables – investment, technology literacy, and consumer demand, while a negative relationship exists between attractiveness and regulatory concern. Lastly, no relationship was found to exist between attractiveness and tariff structures.

Operational Framework

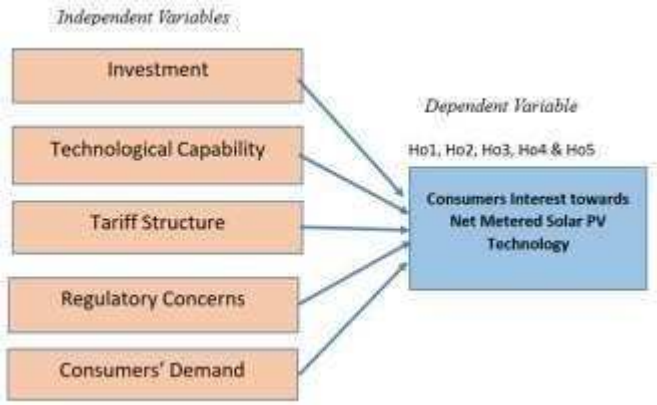

Figure 2. Operational Framework

The operational framework of the study shown in Figure 2 is a simplified version of the conceptual framework adopted from the study of Kumara and Mahakalanda (2019). While the mentioned study took place in Sri Lanka, the current undertaking aimed to determine the factors affecting consumers' interest towards net-metered solar photovoltaic technology in Batangas Province, Philippines.

The study looked to analyze how the independent variables of the study – investment, technological capability, tariff structure, regulatory concerns, and consumers' demand can affect the dependent variable of the study which pertains to the consumers' interest towards net-metered solar PV technology.

Ramirez et al. (2018) defined investment as it pertains to consumers' overall worry about the solar PV systems' comparatively high initial capital expenditures. Government and bank financial incentive programs (for instance, low-interest loans) are emerging; however, they vary from country to country. Payback intervals may be quite extensive.

According to Zawislak, et.al. (2018), technological capability includes not only technical mastery but also the ability to deploy and expand a company's core competencies, combine various technological streams effectively, and mobilize technological resources across an organization.

The impact of the existing tariff structure on the net metering facility is evaluated through the variable representing the tariff structure. Whittington (2018) defines a tariff structure as a set of guidelines that determine the rates applicable to specific consumer groups. The variable "regulatory concerns" aims to comprehend the policies and regulations that foster the expansion of solar, other

Renewable Energies (RE), and Net Metering (NM) technologies, as well as identify any policies and regulations that hinder the progress of RE/NM.

Finally, consumer demand is defined as a significant peak in the historical sales record of power consumption. In terms of energy usage, peak demand refers to a specific moment when there is a simultaneous and considerable customer demand, or when the highest level of demand occurs within a billing period.

C. Objectives of the Study

The objective of studying the factors affecting consumers' interest in net-metered solar photovoltaic (PV) technology in Batangas Province was to identify the relationships between consumers' interest in net-metered solar photovoltaic technology and the independent variables of the study, specifically investment, technological capability, tariff structure, regulatory concern, and consumers' demand.

The findings of the study can assist policymakers, utility companies, and solar industry partners in creating focused techniques to improve buyer awareness, address boundaries, and create a favorable environment for the broad appropriation of net-metered solar PV innovation within the territory.

D. Hypotheses

The hypotheses below were tested in this study:

H_o^1: Investment has no significant effect on consumer interest towards net-metered solar PV technology.

H_o^2: Technological capability has no significant effect on consumer interest towards net -metered solar PV technology.

H_o^3: Tariff structure has no significant effect on consumer interest towards net-metered solar PV technology.

H_o^4: Regulatory concerns have no significant effect on consumer interest towards net- metered solar PV technology.

H_o^5: Consumer demand has no significant effect on consumer interest towards net-metered solar PV technology.

II. MATERIALS AND METHODS

A. Research Design

The researcher employed a descriptive research design with the goal of using data to infer information from statistical analysis and mathematical models. In the study, the variables influencing consumers' interest in net-metered solar photovoltaic technology were investigated. The research design was thought to fit the descriptive quantitative approach best. In order to determine whether factors such as investment, technological capabilities, tariff structure, regulatory concerns, and consumer demand could affect consumers' interest in net -solar PV technology, the researcher also employed an explanatory technique of research.

B. Locale

The researcher conducted the survey within Batangas Province. The researcher chose this as the locale of the study due to its convenience and vast population.

C. Respondents of the Study

The respondents to the study were the 308 utility consumers in the province of Batangas who are under BATELEC I and BATELEC II only. The respondents were chosen through purposive random sampling.

D. Sampling Design

The researcher used purposive sampling to collect data for the study as it is challenging to locate primary data sources that meet the researcher's requirements due to pandemic restrictions and target location. To gather the data, the researcher conducted an online survey. Prior to this, the researcher referred to the Office of Research and Publication's Ethical Guidelines for Online Survey Design. Data collection was administered from February to April 2023.

E. Research Tools and Instruments

In gathering the necessary data, this study used the survey questionnaire found in Appendix A. The questionnaire was adopted from the study of Kumara et al. et al. (2019), entitled "Factors Affecting Consumer Attractiveness Towards Net-Metered Solar PV Technology in Sri Lanka". The researcher, however, deemed it necessary to introduce the respondents to the net-metered solar photovoltaic facility before proceeding with the questions. As such, the questionnaire contains the said introduction.

The survey questionnaire comprises six parts. The primary portion of the survey measures the profile of the respondents in terms of their educational level, source of living, gender, age, and the cost of their monthly electric bill. The second part pertains to investment. It consists of questions that measure the respondent’s perception of the monetary requirement for the net metering facility and their financial return on acquiring a net metering solar PV facility. The next step after an investment is technological capability. This refers to the adaptability of the end users to the technology in terms of their existing house wiring, ease of utilization, and expected efficiency of the facility.

The succeeding part was composed of questions that measured the respondents’ expectations about the regulations to be complied with upon engaging in the net metering program. The items for regulations were then followed by questions that measured the respondents' awareness of the tariff structure upon owning a net metering facility. The consumers’ demand measured the direct demands of the respondents from the net metering facility, such as a decrease in energy consumption, demand for management of energy consumption, and the production efficiency of the facility.

Table 1 shows the questionnaire specification with and number of items per part.

Table 1. Questionnaire Specification

Part & Variable		Item No.
I.	Investment	1 to 7
II.	Technology Capability	8 to 14
III.	Tariff Structure	15 to 17
IV.	Regulations	18 to 22
V.	Consumer Demand	23 to 25
VI.	Interest	26 to 35

F. Data Analysis and Interpretation

This study utilized multiple regression analysis to examine the associations between five independent variables: net metering technology investment, technological capability, consumer concerns related to regulations, the prevailing tariff structure in the country, and consumer demand for electricity consumption.

G. Ethical Considerations

The study also made sure that respondents knew their rights and that answering the survey was voluntary. No personal benefits are guaranteed for the respondents. However, benefits accrue to those who find the research valuable for their organizations. The study also has in place ways to treat the responses with the utmost confidentiality, and the results shall be utilized only for the stated purposes. The researcher believes that participation poses no anticipated risk, harm, discomfort, or inconvenience whatsoever in any way.

III. RESULTS and DISCUSSION

A. Demographic Profile of the Respondents

The demographic profile of the respondents was evaluated in terms of educational level, job, gender, age, monthly electric bill, cooperative, and municipality or city.

The majority of respondents, 277, or 89.90%, have a bachelor's degree, as depicted in Table 1. 18 or 5.80% of the respondents are post-graduates, 8 or 2.60% of the respondents are secondary education graduates, and at least 5 or 1.60% of the findings are educated individuals of primary education.

Table 1. Demographic features of the respondents

Demographic features	Possible options	Responses	Percentage
Educational Level	Primary Education	5	1.60
	Secondary Education	8	2.60
	Bachelor Degree Holder	277	89.90
	Post Graduate	18	5.80
Job	Politician	7	2.30
	Entrepreneur	172	55.80
	Professional	129	41.90
Gender	Male	192	62.30
	Female	116	37.70
Age	20-30	4	1.30
	31 - 40	235	76.30
	41-50	64	20.80
	51-60	4	1.30
	61 and above	1	0.30
Monthly Electricity Bill	Below P5,000	12	3.90
	P5,001 - P10,000	129	41.90
	P10,001 - P20,000	118	38.30
	P20,001 and above	49	15.90
Cooperative	Batelec I	111	36.00
	Batelec II	197	64.00
Municipality/City	Calaca	20	6.50

Balayan	9	2.90
Tuy	3	1.00
Agoncillo	2	0.60
Lemery	26	8.40
Sta Teresita	13	4.20
Taal	20	6.50
San Luis	5	1.60
Lian	6	1.90
Nasugbu	6	1.90
Calatagan	1	0.30
Lipa City	82	26.60
San Jose	12	3.90
Mabini	2	0.60
Mataas na Kahoy	3	1.00
Cuenca	3	1.00
Rosario	25	8.10
Padre Garcia	16	5.20
San Juan	19	6.20
Lobo	1	0.30
Taysan	3	1.00
Tanauan	22	7.10
Malvar	9	2.90

Table 1 also presents the job titles of the respondents, of whom 172, or 55.80%, are entrepreneurs and 129, or 41.90%, are professionals. Somewhere in the range of 7 or 2.30% of the respondents are politicians. This shows that entrepreneurs and professionals are more likely to avail themselves of solar photovoltaic net metering if they have a good source of income or a stable job. One hundred ninety-two (192), or 62.30%, are male, and 116, or 37.70%, are female, which shows more male respondents compared to females as they were the ones who were present during the conduct of the study. The respondents' ages are also shown in Table 1. 235, or 76.30%, are between the ages of 31 and 40, while 64, or 20.80%, are between the ages of 41 and 50. Additionally, 4 or 1.30 percent are between the ages of 20 and 30 and 51 and 60. At least 1 or 0.30% are 61 and above. Solar energy is an environmental and viable matter for most millennials. Indeed, in the event that the upfront cost of solar is high, millennials (31–40 years old) are willing to pay for it because of the natural benefits. Other than that, solar panels are no longer luxury items.

Table 1 depicts the monthly electric bill of respondents, of whom 129, or 41.90%, have a bill between P5,001 and P10,000. 118 of them, or 38.30%, have a bill between P10,000 and P20,000. While 49, or 3.90%, have a monthly bill of P20,001 or more, the fewest respondents have a bill below P5,000. One hundred twenty-nine (129) respondents with P5,001 and P10,000 monthly bills are professionals and entrepreneurs with the usual appliances used at home. Even though they spend more time with work or business and are limited to staying at home and using their appliances, their monthly bills are still high.

Table 1 depicts the cooperative nature of the respondents, of whom 197, or 64%, are under Batelec II and 111, or 36%, are under Batelec I. Most of the respondents are from BATELEC II, as their cities and municipalities are nearby compared to BATELEC I.

The municipality or city of the respondents is depicted in appendix I, with 82, or 26.30%, residing in Lipa City and 26, or 8.40%, residing in Lemery, Batangas. While 25 or 8.10% of the population resides in Rosario and 22 or 7.10% in Tanauan. With 82

respondents from Lipa city and considered a rich city, this shows more professionals and entrepreneurs are interested with net metering.

B. Descriptive Statistics

The study also sought to determine the level of the resulting mean of each of the key variables of the study for investments, technological capability, tariff structure, regulations, consumer demand, and interest.

Investment

Table 2. Investments

Indicators	Mean	Standard Deviation
I am aware of the initial cost paid for net metering installations	4.89	0.4280
I expect an acceptable payback period for net metering facility	4.90	0.4063
I expect the life span of solar photovoltaic panel commensurate the initial cost invested	4.88	0.4216
I find the warranty period being offered by the supplier / vendors of Solar PV reasonable	4.90	0.3866
I find the PV system profitable	4.90	0.3815
I believe the initial cost will be recouped	4.90	0.3899
I find the PV system a secure financial investment	4.89	0.4356
Average	**4.89**	**0.3956**

In the preceding table 2, the variables connected with investments are organized into seven (7) distinct indicators or statements. Which, in turn, has resulted in a total of four (4) highest-revealing statements having a weighted mean of 4.90. The majority of the responses highlight the statements that "I believe the initial cost has been recouped," "I find the PV system profitable," "I expect an acceptable payback period for a net metering facility," "I find the warranty period being offered by the supplier or vendors of solar PV reasonable," and "I find the PV system profitable."

According to the figures that were shown previously, customers that use distributed energy assets to create their own electricity benefit significantly from net metering in the form of extra kWh consumption which send back to the grid of utility companies. This is due to the fact that net metering plays a crucial role in reducing the monthly power bills incurred by customers and ensuring the success of investments made in renewable energy sources. All of the respondents have mentioned that they are looking forward to a profitable system, an adequate payback, and appropriate warranty offerings.

The findings are similar to the findings in the study of Kumara and Mahakalanda (2019) who stated that their study demonstrates that net metering investment has a beneficial impact on customer interest in net-metered solar PV technology. The analysis found that although net-metering is not currently commonly used, the combination of falling PV system costs and rising power prices seen globally will likely make such a plan appealing to both investors and policymakers (Public Utilities Commission of Sri Lanka, 2018).

Technological Capability

The technological capabilities of the net metering, as assessed by the respondents, are presented in Table 3, with an average mean of 4.89 and a standard deviation of 0.38. The finding that "I expect adaptability of the net metering facility with my existing house wiring" had the maximum number of votes, with a mean of 4.90 and a standard deviation of 0.37. It is then followed by a statement that highlighted the statements "I believe in the efficiency of solar photovoltaic panels," "I expect minimal failures or downtime to a net-

metered solar photovoltaic facility," "I expect to manage the size of solar panels in my house to generate the required capacity," and "I expect ease in using the net-metered solar photovoltaic technology," both of which have a mean of 4.89.

Table 3. Technological Capability

Indicators	Mean	Standard Deviation
I expect minimal maintenance on the net-metered solar photovoltaic facility	4.87	0.4423
I believe that with the PV system I can produce the quantity of energy that I need	4.88	0.4263
I believe in the efficiency of solar photovoltaic panels	4.89	0.4077
I expect minimal failures or downtime to net-metered solar photovoltaic facility	4.89	0.4356
I expect the adaptability of the net metering facility with my existing house wiring	4.90	0.3746
I expect to manage the size of solar panel in my house to generate required capacity	4.89	0.4014
I expect ease in using the net metering solar photovoltaic technology	4.89	0.4046
Average	**4.89**	**0.3789**

According to the findings that were presented, net metering is a method for controlling the cost of your power bills that enables you to "store" energy that is produced in excess by your solar panels in the grid. Users have voiced their hopes that the net metering facility will be compatible with their existing home wiring, that they will be able to customize the size of their solar panels to meet their power needs, and that they will have little difficulty adopting the new solar photovoltaic technology. All of these hopes are related to the fact that users are hoping that the facility will be compatible with their existing home wiring.

According to Rivera (2021), the major purpose of net metering is to counteract the amount of power that customers of utility grids use, which in turn lowers the customers' monthly costs. In the not-too-distant future, a practice known as "net metering" may be used to assist customers in getting the most out of the power that is produced by distributed energy resources (DER) located on their properties. In addition, the usage of renewable energy, which is essential for the preservation of the environment, would be facilitated with the assistance of net metering.

Tariff Structure

The tariff structure-related indicators of net metering were assessed by the respondents to have a mean of 4.88 on average, with a standard deviation of 0.44. These indicators were presented in Table 4, which can be found above. In this case, the incurred mean for both statements "I expect full benefits of the net pricing scheme" and "I expect a reasonable rate of charges in my engagement in a net-metered solar photovoltaic facility" is 4.88. The result that received the fewest number of responses was that respondents "expect savings in the electricity bill through the net metering facility," with a mean score of 4.87 and a standard deviation of 0.47.

Table 4. Tariff Structure

Indicators	Mean	Standard Deviation
I expect the full benefits of the net pricing scheme	4.88	0.4367
I expect a reasonable rate of charge for my engagement in Net-metered solar photovoltaic facility	4.88	0.4263
I expect savings in the electricity bill through the net metering facility	4.87	0.4709
Average	**4.88**	**0.4386**

According to the figures that were shown previously, clients that install distributed energy assets to create their own power have strong financial incentives to do so as a result of net metering. This is due to the fact that net metering plays an essential role in lowering the monthly power bills of customers and ensuring the success of investments made in renewable energy sources. Installers of solar panels can lend a hand in preventing damage to the natural world and protecting valuable assets, and they do not even have to do anything out of the ordinary to accomplish these goals. This is supported by the observation that was made by Kumara (2019), who stated that homes that employ net metering have a propensity, on the whole, to be more mindful of their energy consumption, which ultimately results in a reduction. This finding lends credence to the aforementioned assertion.

However, based on the study of Yamamoto (2018), it is not possible to conclude that the tariff structure has an impact on consumers' willingness to use net-metered solar PV technology. According to the data, very few net metering customers are aware of the current tariff structures because they are still mainly concerned with cutting their electricity costs. Therefore, it is concluded that consumers' interest in net metering technology is unaffected by the pricing structure.

Regulatory Concerns

The regulations related to the indication of net metering as viewed by the respondents were given a mean of 4.87 and a standard deviation of 0.45 in the aforementioned Table 5. It emphasizes the statement that respondents "expect financial support from the government or other private sector in acquiring net-metered solar photovoltaic facilities," with a mean that is the highest possible at 4.88 and a standard deviation that is the lowest possible at 0.45.

Table 5. Regulation Concerns

Indicators	Mean	Standard Deviation
I expect distribution utilities to have standards on metering	4.87	0.4568
I expect ease in adopting the standards to be imposed by utilities like BATELEC II	4.87	0.4621
I expect incentives in purchasing net metering facility	4.87	0.4595
I expect financial support from the government or other private sector in acquiring net-metered solar photovoltaic facility	4.88	0.4541
I expect ease in complying with the safety requirements for net metering	4.87	0.4595
Average	**4.87**	**0.4518**

This means that the data revealed that they are anticipating support from the government or another private sector in obtaining a net-metered solar photovoltaic project and expecting simplicity in complying with the safety regulations for net metering. Moreover, they expect aid in obtaining a net-metered solar photovoltaic project.

It is reinforced by the observation that was made by Kumara (2019), who noted that homes that make use of net metering have a propensity, on the whole, to be more conscious of their energy consumption, which ultimately results in a reduction. This finding lends credence to the claim that net metering encourages a decrease in energy consumption. This is due to the fact that net metering plays a crucial role in lowering the monthly power costs of customers and ensuring the success of investments made in renewable energy sources. In addition, this is the case because net metering plays an essential role in ensuring the success of investments. Installers of solar panels may lend a hand in preventing harm to the natural world and preserving important assets, and they don't even have to do

anything out of the ordinary to accomplish these aims. Installers of solar panels can help prevent damage to the natural world and protect precious assets.

The study of Sawin, et. al. (2018) on the other hand, research indicates that regulatory concerns have a negative impact on consumer interest in adopting net-metered solar PV technology. The sluggish progress of net metering technology can largely be attributed to regulatory barriers rather than purely technical limitations. Consumer demand for net metering is influenced by unit selling prices, and once they have access to net metering connections, their demand increases as they opt to consume more energy by adding electrical appliances for domestic purposes, such as electric ovens, refrigerators, home theaters, and air conditioners. Hence, according to Chao (2018), net-metered solar PV technology offers the most effective means to decrease electricity costs while simultaneously boosting consumers' desire for increased electricity usage. As a result, the positive correlation between consumer demand and the attractiveness of net-metered solar PV technology is fully justified.

Consumers Demand

Table 6. Consumers Demand

Indicators	Mean	Standard Deviation
I expect PV system to give me more control over my energy requirement	4.90	0.39
I expect that PV system will produce the amount of energy that I need	4.90	0.38
I expect favorable decrease of my energy consumption from the grid through net metering facility	4.90	0.39
Average	**4.90**	**0.37**

The consumers' demand for net metering is shown in Table 6 above, with a mean of 4.90 and a standard deviation of 0.37. The mean is the average value, and the standard deviation is 0.37. Whereas, each of the three indicators reached the same mean value of 4.90, which highlights the following statements: "expect that the PV system will produce the amount of energy that I need," "expect that the PV system will give me more control over my energy requirement," and "expect a favorable decrease in my energy consumption from the grid through the net metering facility."

According to this argument, the implementation of metering results in the generation of considerable financial motivational forces for consumers who employ distributed energy assets to generate their own power. This is because metering plays a vital role in reducing the monthly power expenses of customers and enhancing the success of investments in renewable energy sources. It is projected that the use of power from the utility's system will be essentially counterbalanced by net metering, which will result in decreased monthly costs for customers (Rivera, 2021). Therefore, net metering may be able to assist in the reduction of peak load hours, which may be able to give utilities and customers a variety of benefits, such as better system dependability, decreased power prices, and a reduction in the number of true control losses. These benefits may be able to provide utilities and customers with a range of benefits. If the top stack time can be shortened throughout the process of expansion, it may be possible for utilities to put off having to perform capacity overhauls on their grids for as long as possible.

Consumer Interest

Table 7. Consumer Interest

Indicators	Mean	Standard Deviation
I expect a high level of satisfaction on net metered solar photovoltaic technology.	4.90	0.40

I can recommend net metering facility to other customers	4.90	0.39
I believe using solar energy produces no air or water pollution and no greenhouse gases.	4.90	0.37
I believe supply of solar energy is infinite unlike non-renewable sources of energy	4.90	0.39
I believe the PV system can protect the environment	4.90	0.40
I don't find a PV system bringing too many risks	4.90	0.39
I expect to gain social recognition in owning a net metering facility	4.89	0.41
I believe in the valuable contribution of renewable energy technologies in reducing carbon emission	4.90	0.39
I believe everyone benefits from the renewable energy through lower emissions and reduce reliance on fuels	4.92	0.36
I believe that PV system will show that I am concerned with about enrolment	4.92	0.36
Average	**4.90**	**0.37**

The respondents rated the interest-related indicators of net metering with an average mean of 4.90 and a standard deviation of 0.37, as shown in Table 7. The statements with the highest mean scores were "believe everyone benefits from renewable energy through lower emissions and reduced reliance on fuels" and "believe that PV systems will demonstrate that I am concerned about enrollment." It highlights that, if implemented, net metering would be able to offer assistance in the use of renewable energy, which would in turn be extremely significant for the environment. This is emphasized by the fact that it would be able to provide support for the consumption of renewable energy. It would be irresponsible to ignore the fact that the implementation of net metering has the ability to bring about the substantial acquisition of numerous benefits. There is a possibility that net metering will assist in reducing peak load hours. This has the potential to bring several advantages to both utilities and customers. Increased system reliability, lower power costs, and lower actual control losses are only some of the benefits that can be gained from this. If the top stack time can be shortened throughout the process of expansion, it may be possible for utilities to put off having to perform capacity overhauls on their grids for as long as possible. Solar energy does not have a limited supply, according to Rivera (2021); nonetheless, the energy that is harvested from this source may only form a minor fraction of the entire energy mix in the world at this moment. The power output efficiency of solar panels has increased as a result of improvements in efficiency, breakthroughs in storage technology, and extended capabilities of the equipment. Additionally, the overall cost of the system has decreased as a result of these factors.

Factors Affecting *Consumers'* Interest Towards Net-Metered Solar Photovoltaic Technology in Batangas Province

Table 8, shows the summary of the result of regression to investigate whether an investment, technological capability, tariff structure, regulations, and consumer demand significantly affect consumers' interest in net-metered solar photovoltaic cells to address all the hypotheses of the study. A negative value for unstandardized beta mean that variables correlate in a negative direction. If the beta coefficient is negative, it means that for every one-unit increase in the independent variable, the dependent variable will decrease by the beta coefficient value. Negative beta can still be significant if p-value is <.05. In other words, there is an inverse relationship between the two variables. The findings of the research suggest that consumer interest in adopting net-metered solar PV technology is negatively impacted by regulatory concerns. This indicates that the slow growth of net metering technology is primarily attributed to regulatory barriers rather than technical limitations. The demand from consumers is influenced by the selling price of units. Once consumers have access to net metering connections, they tend to increase their energy demand by utilizing additional electrical appliances such as electric stoves, refrigerators, home theaters, and air conditioners in their households. Consequently, net-metered solar PV offers an excellent

solution for reducing electricity expenses while simultaneously driving consumer demand for power usage. Therefore, there exists a valid positive correlation between consumer demand and the level of interest in net-metered solar PV technology.

Table 8. Factors Affecting Consumers' Interest Towards Net-Metered Solar Photovoltaic Technology in Batangas Province

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Investment	0.022	0.058	0.464	15.655	0.000
Technological Capability	0.439	0.028	0.391	9.914	0.000
Tariff Structure	0.386	0.039	-0.201	-5.930	0.000
Regulations	-0.172	0.029	-0.111	-3.024	0.003
Consumer Demand	-0.092	0.031	0.431	9.599	0.000
Model Summary				**ANOVA**	
R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
.981	0.963	0.963	0.072	1582.346	.000

Effect of Investment on *Consumer's* Interest

Results show that investment positively affects consumers' interest. This means that investment predicts or is a determinant of a consumer's interest, and the effect is found to be significant (β=.022, p- value=0.000). Overall, the result of regression indicated that 96.3% of the independent variable predicts the dependent variable (R2=.963, F=1582.346, p-value<0.05). It can be noted that investment factors could lead to consumers' interest in net-metered solar photovoltaic cells. For example, if the consumer is aware that the initial cost of net-metering installation is commensurate with the benefit that they would reap from it, this could spark interest in buying the product. Moreover, if consumers expect that the life span of a net-metered photovoltaic cell justifies its initial investment, they will be more interested in it. It is also supported by the study of monetary policy and consumers' demand by Cavallari in 2020, wherein incorporating realistic demand features in a macroeconomic environment is important for understanding the behavior of aggregate consumption over the cycle and the way it contributes to spreading the effects of shocks. Exploring the role of consumers' demand for the stabilization of output and inflation.

Effect of Technological Capability on *Consumer's* Interest

Based on the table, the result of the regression done to investigate the effect of technological capability on consumers' interest is positive. Moreover, such an effect is deemed to be significant, which indicates that technological capability is one of the factors that drive consumer interest (β=.439, p- value=0.000). Overall, the result of regression revealed that 96.3% of the independent variable predicts the dependent variable (R2=.963, F=1582.346, p-value<0.05). For example, expect minimal maintenance on the net-metered solar photovoltaic facility.

This implies that consumers who tend to be interested in net-metered photovoltaic solar cells consider the technological capabilities of net-metered photovoltaic technology. To further discuss, if consumers expect that there is minimal maintenance that they incur in keeping a net-metered photovoltaic facility, the more it drives them to know more about the product, which leads to an increased level of consumer interest. Similarly, if they believe that net-metered photovoltaic panels can provide them with zero downtime, they will be more interested in buying them. It is supported by the study by Seet, et al. (2018), wherein the occurrence of Industry 4.0 in the manufacturing industry, which is rapidly growing in a very short space of time, triggered uncertainty on manufacturing firm technological capabilities and hence demanded that the firm's technological capabilities soared dramatically.

Effect of Tariff Structure on *Consumer's* Interest

It can be gleaned from the table, based on the presented values, that the tariff structure has a positive effect on the consumer's interest, which denotes that the existing tariff structures could be a deciding factor in the purchase of net-metered photovoltaic panels. For example, expect savings in the electricity bill through the net metering facility. The effect of the independent variable on the dependent variable is significant (β=.386, p-value=0.000). Overall, the result of regression indicated that 96.3% of the independent variable predicts the dependent variable (R2=.963, F=1582.346, p-value<0.05). It is worth noting that consumers really look after the electricity savings that they can get if they substitute their source of power with a net-powered photovoltaic facility. Their expectations of the cost-saving promise of a solar-powered electricity source could be one of the deciding factors or make them interested in replacing their source with net-metered photovoltaic technology. It is also supported by the study of the impact of tariff structure on the economics of behind-the-meter solar microgrids by Wright et al. (2021), wherein baseload electric power generation is supplied by hydro and nuclear power, with some hydro and natural gas plants brought online during peak periods. The costs of maintaining these peak-load power plants throughout the year are factored into the tariff with a charge known as the "global adjustment" (GA).

Effect of Regulations on *Consumer's* Interest

Results show that regulations negatively affect consumer's interest. This means that regulations predict or is a determinant of regulation, and the effect is found to be significant (β= -0.172, p-value=0.000). Overall, the result of regression indicated that 96.3% of the independent variable predicts the dependent variable (R2=.963, F=1582.346, p-value<0.05).

Regulations can play a vital role in safeguarding consumer interests by ensuring safety, fairness, transparency, and accountability in the marketplace. By establishing guidelines and standards, regulations contribute to a more level playing field, empowering consumers to make informed choices and protecting them from potential harm or exploitation. For example, expect financial support from the government or other private sectors in acquiring a net-metered photovoltaic facility.

It is also supported by the study of a method for analyzing the economic viability of net energy metering regulation based on risk analysis by Komeno, et al. (2020), considering three different adoption scenarios. A univariate sensitivity analysis is carried out to determine how the key parameters affect the economic analysis.

Effect of Consumer Demand on *Consumer's* Interest

Based on the table, the result of the regression done to investigate the effect of consumer demand on consumer interest is negative. Moreover, such an effect is deemed to be significant, which indicates that technological capability is one of the factors that drive consumer interest (β= -0.092, p-value=0.000). Overall, the result of regression revealed that 96.3% of the independent variable predicts the dependent variable (R2=.963, F=1582.346, p-value<0.05).

Consumer demand acts as a catalyst for positive changes in the marketplace, driving businesses to meet consumer interests and provide improved choices, quality, affordability, customer service, innovation, and sustainability. By expressing their preferences through demand, consumers wield significant influence in shaping the market and promoting their own interests. For example, one consumer expects a favorable decrease in his energy consumption from the grid through the net metering facility.

It is also supported by the study of the impacts of the co-adoption of electric vehicles and solar panel systems: empirical evidence of changes in electricity demand and consumer behaviors from household smart meter data, wherein consumers may adapt EV charging to the variable solar energy generation and shift EV charging to the hours when solar panels are generating electricity. Studies have already shown that behavioral changes may occur after solar panel adoption. Consumers may use more electricity when the marginal cost of electricity generation becomes tiny (Liang, Qiu, & Xing, 2022).

The results of the current study are quite similar to the results of the adopted literature written by MAS Kumara. The significant predictors of net-metered solar PV's attractiveness in Kumara's study are tariff structure and consumers' demand, while in this study the predictors are investment, technological capability, tariff structure, regulations and consumers' demand. The context of net metering in the Philippines and Sri Lanka differs. Sri Lanka went ahead in the implementation of the net metering thus, the tariff structure in the country emerged as one of predictors. The efficiency of the technology was seen by the Sri Lankans but requires having a new rate structure for the "prosumers". On the other hand, the consumers in the Philippines particularly the consumers of BATELEC I and BATELEC II were eager to experience the technology of net- metered solar PV.

IV. CONCLUSION

Results showed that the results show positive correlations between the independent variables- investment, technological capability, and tariff structure. While negative correlations for regulatory concerns, and consumers' demand and the dependent variable – consumers' interest towards net-metered solar PV technology. The findings indicate that the mentioned factors affect the consumers' interest to use photovoltaic technology in Batangas Province.

Further, it was revealed that investment, technological capability, tariff structure, regulatory concerns, and consumers' demand significantly affect consumers interest towards net- metered solar PV technology. Therefore, the study fails to reject H_{o1}, H_{o2}, H_{o3}, H_{o4}, and H_{o5} or all its hypotheses. Models of net metering enable solar panel proprietors to save money and energy while fostering the development of regional power resources. Additionally, it refers to a system in which a consumer is connected in both directions to the grid. Solar panels create the most energy in the middle of the day when the sun is shining. Problematically, the center of the day is also the time when the least amount of control is exercised. Net metering provides substantial financial incentives for customers who use distributed energy assets to generate their own electricity, as it plays a crucial role in reducing their electricity bills and promoting the success of renewable energy investments. It is anticipated that net metering will effectively offset the utility's grid power consumption in order to reduce consumer costs. In the future, consumers may be able to utilize the majority of the energy generated by their on-site DERs through net metering. Thus, it is evident that financial benefits are one of the factors influencing consumers' interest in net-metered solar photovoltaic technology in Batangas Province.

V. RECOMMENDATION

Since there is a correlation between investment, technological capability, tariff structure, regulatory concerns, consumer demands, and consumers' interest towards net-metered solar PV technology, it is possible to inform potential customers about current technologies and their effects. Regulators or the government may support net metering technology in the nation for this reason. At the national or provincial level, various net metering and net billing prices can be introduced. As a result, it makes sense to inform customers about all of their options and give them the freedom to choose the best one for themselves. Under the current system, it takes a very long

time to get the requirements for solar PV net metering connections met. Therefore, the government may look to offer the chance through a transparent, competitive mechanism.

To make the net metering market more appealing, the initial cost of installing a net metering facility can be subsidized with public and private sector financial support. Low-interest loans with lengthy payback periods from the government or banks can be made available. Therefore, financial systems continue to be crucial tools for encouraging the deployment of new projects and the outstanding development of the net-metered solar PV industry. To benefit the most from net metering facilities, those must be fully exploited. The lifespan of the panel and inverter, reliability, the cost of repair and maintenance, and other factors affecting customer impression of solar panel technology should thus be favorably stimulated. Safety is, of course, a matter that should be handled seriously by everyone. In order to guarantee power quality and prevent back feeding during a utility power loss, the safety features should make sure that the power provided to the grid is synced with the utility power.

A. Limitations

It is advised that future researchers undertake a study on a different region in order to cover a larger sample and more locations as well as the possibility that each region may have its own distinct culture and viewpoint. Companies can better understand Filipino consumers by analyzing respondents from other regions. To obtain the respondents' firsthand opinions, the mixed technique of research may also be used.

B. CAPSTONE

The proposal to electric companies is to have community solar programs. The objective is to promote net-metered solar energy consumption through workshops and training in partnership with distribution utility companies, promoting the patronage of solar photovoltaic energy.

This includes cost savings wherein for return on investment (ROI), installing solar panels is an investment that can yield long-term returns. The ROI depends on factors such as the upfront cost of the system, available incentives or rebates, energy savings, and the net metering policies in your area. In many cases, solar panel systems can pay for themselves within 5 to 10 years, after which you can enjoy free or significantly reduced electricity for the remaining lifespan of the system. Next is information, wherein when you have a solar panel system installed on your property, it generates electricity from the sun. This electricity can be used to power your home or business. In the event that solar panels produce more energy than they consume, the excess energy is fed back into the grid. With net metering, the utility company measures both the electricity you consume from the grid and the excess electricity you export. You receive credits on your electricity bill for the excess energy, which can offset future consumption. Thirdly is demonstrate installation, where a few steps to demonstrate include site assessment, system design, obtaining permits, installing mounting structures, installing solar panels, installing electrical components, connecting to the electrical system, kWh meter installation, inspection and approval, and net metering. Fourth is to provide financial information, where financial aspects to consider are energy savings, net energy metering credits, return on investment, avoided price increases, and additional. To add is the create incentives where potential incentives are net metering compensation, feed-in tariffs, tax credits and rebates, grant programs, and renewable energy certificates. And lastly, online platforms for promotion (webinar, social media, website and video blogging).

Acknowledgements

The researcher would like to extend their deepest gratitude and thanksgiving to the following individuals for without them this research paper will not be possible:

To my beloved adviser Dr. Edgar Allan G. Castro, having inspired the researcher right from the start of the conception of the topic for this research, for all the insights, instructions, encouragements, and motivations that truly took the interest of the researchers until the completion of this paper.

To Dr. Allan Nicko Rodelas, the researcher statistician, who extended help more than what was due of him.

To Mr. Honorato A. Sebulino and Dr. Sheila Maloles, the researchers' Teacher-in-Charge, who patiently entertained all the queries that the proponents had, his assistance and guidance in meeting the researchers' needs for the completion of this paper.

To Engr. Allan Nortez Dr. Jasmin De Silva and Mr. Emilio Manuel Macaso, the researchers' set of panelists, for their ideas, suggestions, and expertise that helped improve the content of this paper.

To the researcher's classmates who encouraged the researchers to perform at their best and shared the agony of beating deadlines. With them, the researchers never felt alone in this 'battle'.

To the researcher's family and friends, having extended all the support and understanding on the endeavors of the researchers.

And above all, to the Lord God Almighty, for the enumerable blessings, guidance and wisdom given to the proponents. For His grace and unending unconditional love for the researcher. Without His blessings and mercy, this research will not be possible and successful, and the researchers offer this research for his greater glory.

References

Ahmad, N., Othman, S. N., & Mad Lazim, H. (2014). A review of technological capability and performance relationship in manufacturing companies. International Symposium on Technology Management and Emerging Technologies (pp. 193–198).

Ahmed, W., Najmi, A., Mustafa, Y., & Khan, A. (2019). Developing model to analyze factors affecting firms' agility and competitive capability: A case of a volatile market. Journal of Modelling in Management, 14(2), 476–491.

Cavallari, L. (2020). Monetary policy and consumers' demand. Economic Modelling, 92, 23–36. https://doi.org/10.1016/j.econmod.2020.06.022

Chao, H.-p. (2018). Efficient pricing and investment in electricity markets with intermittent resources. Energy Policy, 39(7), 3945 3953.doi: http://dx.doi.org/10.1016/j.enpol.2011.01.010

Daaboul, J., Moriarty, P., Palmer, G. Honnery, D. (2022). Making energy green-A method for quantifying the ecosystem maintenance energy and the green return on energy invested. J. Clean. Prod. 344, 131037. https://doi.org/10.1016/j.jclepro.2022.131037

Diesendorf, M., Elliston, B., 2018. The feasibility of 100% renewable electricity systems: a response to critics. Renewable Sustainable Energy Rev. 93, 318–330.

Energy Sage, 2021, Solar panel technology: learn about the latest advances in solar energy

ERC, 2022, ERC Adopts Amendments to the Net-Metering Rules

ERC, 2022, ERC Formally Launches the Amended Net-Metering Rules in Sto. Tomas, Batangas Guangul, (2019)

Komeno, A. S. F., De Leles Ferreira Filho, A., Domingues, E. G., Vieira, D., & De Rezende Raggi, L. M. (2022). Method for analyzing theeconomicviability of net energy metering regulation based on risk analysis. Energy for Sustainable Development, 69, 11–30. https://doi.org/10.1016/j.esd.2022.05.009

Kumara, S; Mahakalanda, I. IET Conference Proceedings; Stevenage Stevenage: The Institution of Engineering & Technology. (Oct 24,2019) DOI:10.1049/cp.2019.0315

Lau, L., Choong, Y., Wei, C., Seow, A., Choong, C., Senadjki, A., & Ching, S. (2020). Investigating nonusers' behavioral intention towards solar photovoltaic technology in Malaysia: The role of knowledge transmission and price value. Energy Policy, 144, 111651. https://doi.org/10.1016/j.enpol.2020.111651

Liang, J., Qiu, Y., & Xing, B. (2022). Impacts of the co-adoption of electric vehicles and solar panel systems: Empirical evidence of changes in electricity demand and consumer behaviors from household smart meter data. Energy Economics, 112, 106170.https://doi.org/10.1016/j.eneco

Lim, C., Ryu, J., Choi, Y., Woo, S. and Lee, W. "Understanding global PM2 5concentrations and their drivers in recent decades

(1998 – 2016)," Environment International, Vol. 144, No. March, p. 106011, 2020.

Public Utilities Commission of Sri Lanka. (2018). Net-Metering Development in Sri Lanka. Retrieved from Public Utilities Commission of SriLanka.

Pratiwi, S. Juerges, N. (2020). Review of the impact of renewable energy development on the environment and nature conservation in Southeast Asia. Energy, Ecol Env 5 (4), 221-239, https://doi.org/10.1007/s40974-020-00166.2

Ramirez Camargo, L., Franco, J., Sarmiento Babieri, N.M., Belmonte, S., Escalante, K., Pagany, R., &Dorner, W. (2018). Technical, Economical And Social Assessment of Photovoltaics in the Frame of the Net-Metering Law for the Province of Salta,Argentina. Energies, 9(3), 133.

Sanchez-Zapata, J.A., Clavero, M., Carrete, M., DeVault, T.L., Hermoso, V., Losada, M.A.,et al., 2016. Effects of renewable energy production and infrastructure on wildlife. In: Current Trends in Wildlife Research. Springer, Cham, pp. 97–123. https://doi.org/10.1007/978-3-319-27912-1_5

Seet, P., Jones, J., Oppelaar, L. and Zubielqui, G. (2018). Enhancing human capital with social capital via entrepreneurial learning in a start-up accelerator.

Ranjith, VGU. (2014). "Cost reflective water tariff policy framework for domestic water sector of Sri Lanka."

Raugei, M., Fullana, P., and Fthenakis, V. (2018). The energy returns on energy investment (EROI) of photovoltaics: methodology and comparisons with fossil fuel life cycles. Energy Pol. 45, 576-582. https://doi.org/10.1016/j.enpol.2018.03.008

Rezvani, M., Phattanasak, M., Gholami, A., Zandi, M., and Goachani, R. (2022). A review of the factors affecting the utilization of Solar photovoltaic panels

Rivera, (2021), EDC calls for stronger policies for net metering

Sawin, J., Martinot, E.,Douglas B., Angus,MC.,Roussell, J., Sims, R.,Brien, V., Rana A.,Skeen, J. and Musolino, E (2018)."renewables 2018-Global status report."

Solar Reviews, (2022). What is net metering and how does it work?

Taylor, (2021). The ethics of solar power are more complicated than you think

US Department of Energy Solar Energy Technologies Office. (2021). Solar futures study.

Waaree, (2022) What is Solar Net Metering and How Does it Work?

Whittington, D. (2018). Tariff Structure. Treatise on Water Science

Wright, D. W., Ashwell, J. T., Ashworth, J., Badruddin, S., Ghali, M., & Robertson-Gillis, C. (2021). Impact of tariff structure on the economics of behind-the-meter solar microgrids. Cleaner Engineering and Technology, 2, 100039. https://doi.org/10.1016/j.clet.2020.10003