

**RELATIONSHIP OF CONSUMPTION PATTERN
ON MALAYSIAN CONSUMER TOWARD
RENEWABLE ENERGY**

NORSUHADA BINTI ISA

**MASTER OF SCIENCE
(RESOURCE MANAGEMENT)**

**UNIVERSITI PERTAHANAN NASIONAL
MALAYSIA**

2021

**RELATIONSHIP OF CONSUMPTION PATTERN ON MALAYSIAN
CONSUMER TOWARD RENEWABLE ENERGY**

NORSUHADA BINTI ISA

Thesis submitted to the Centre for Graduate Studies, National Defence University of
Malaysia, in fulfilment of the requirements for the Master of Science (Resource
Management)

April 2021

ABSTRACT

Over the past century, conventional energy contributes to the environmental issue. The drastically increase of using renewable energy worldwide because consumers nowadays realized that conventional energy was almost dry up and cause pollution to the environment. The promoting of renewable energy as sustainable energy source does not work indeed when consumer is concerned about environmental issues. Apart from the price instability, the consumption of renewable energy among residents still needs to be explored despite of consumer's awareness about environmental issues. This has driven scientists to look for renewable energy that with less pollution is more user-friendly. In Malaysia's context, it launched Feed-in Tariff (FiT), Net Energy Metering (NEM) schemes and most recently on Large Scale Solar (LSS) program to encourage renewable energy to the public as various energy sources to reduce carbon emissions and support the country's energy demand by 2020. This study aims to investigate the relationship between consumer's concern, knowledge, acceptance, attitude, and belief towards willingness to pay more for renewable energy among bill payers in Peninsular Malaysia. By using the theory of reasoned action as the theoretical underpinning theory, the questionnaire survey was distributed to the bill payers throughout Klang Valley, Malaysia. Based on the 179 responses, this study suggests consumer's concern, knowledge, belief, and acceptance towards renewable energy are positively related to paying a premium for renewable energy. To test the five research hypotheses, Partial Least Square was employed. This study results suggest that the energy consumption pattern affects the ability of customers to pay more toward renewable energy. This will be very beneficial to the

policymakers, in line with the Eleventh Malaysian plan in pursuing the green technology growth.

Keywords: consumer acceptance, consumer attitude, consumer belief, consumer concern, consumer knowledge, Feed-in Tariff (FiT), Large Scale Solar (LSS), Net Energy Metering (NEM), renewable energy, theory of reasoned action (TRA), willingness to pay.

ABSTRAK

Sepanjang abad yang lalu, tenaga konvensional telah menyumbang kepada permasalahan alam sekitar. Peningkatan drastik penggunaan tenaga boleh diperbaharui di seluruh dunia kerana pengguna pada masa ini menyedari bahawa tenaga konvensional hampir kering dan menyebabkan pencemaran terhadap alam sekitar. Mempromosikan tenaga boleh diperbaharui sebagai sumber tenaga lestari tidak akan berfungsi apabila pengguna prihatin terhadap masalah alam sekitar. Selain daripada ketidakstabilan harga, penggunaan tenaga boleh diperbaharui di kalangan penduduk masih perlu diterokai walaupun terdapat kesedaran pengguna mengenai masalah alam sekitar. Ini mendorong para saintis mencari tenaga boleh diperbaharui yang dengan pencemaran yang lebih sedikit lebih mesra pengguna. Dalam konteks Malaysia, ia melancarkan Feed-in Tariff (Fit), skema Meteran Tenaga Bersih (NEM), dan yang paling baru pada program Solar Skala Besar (LSS) untuk mendorong tenaga boleh diperbaharui kepada orang ramai sebagai pelbagai sumber tenaga untuk mengurangkan pelepasan karbon dan menyokong permintaan tenaga negara pada tahun 2020. Kajian ini bertujuan untuk mengkaji hubungan antara keprihatinan, pengetahuan, penerimaan, sikap, dan kepercayaan pengguna terhadap kesediaan untuk membayar lebih banyak tenaga yang boleh diperbaharui di kalangan pembayar bil di Semenanjung Malaysia. Dengan menggunakan teori tindakan beralasan (TRA) sebagai teori pendukung teori, tinjauan soal selidik diedarkan kepada pembayar bil di seluruh Lembah Klang, Malaysia. Berdasarkan 179 respon, kajian ini menunjukkan keprihatinan, pengetahuan, kepercayaan, dan penerimaan pengguna terhadap tenaga boleh diperbaharui berkaitan positif dengan membayar premium untuk tenaga yang dapat diperbaharui. Untuk menguji lima hipotesis penyelidikan, Partial Least Square

digunakan. Hasil kajian ini menunjukkan bahawa corak penggunaan tenaga mempengaruhi kemampuan pelanggan untuk membayar lebih banyak untuk tenaga yang diperbaharui. Ini akan sangat bermanfaat bagi pembuat dasar, sejajar dengan rancangan Kesebelas Malaysia dalam mencapai pertumbuhan teknologi hijau.

Kata kunci: penerimaan pengguna, sikap pengguna, kepercayaan pengguna, keprihatinan pengguna, pengetahuan pengguna, Feed-in Tariff (FiT), Solar Skala Besar (LSS), Pengukuran Tenaga Bersih (NEM), tenaga boleh diperbaharui, teori tindakan beralasan (TRA), kesediaan untuk bayar.

ACKNOWLEDGEMENTS



First and foremost, I am thankful to Allah for all the countless blessings, mercy, health and opportunity bestowed on us, which enable me to complete the research. It has been a long, challenging journey to complete this thesis.

My sincere thanks to both of my parents Isa Bin Said and Halimah Binti Husien. Special thanks also given for all my sisters, who are always give me support for whole my life. Thanks for blessing, supporting and Doa' for me. Your love always makes me feel warm and you encourage myself to do better in life. Thank you for always staying by my side, in happiness and sadness.

I would like to acknowledge and extend my heartfelt gratitude to my research supervisor, Assoc. Prof Dr. Zailin Zainal Ariffin for her vital encouragement and support. I really appreciate her commitment to allocate her precious time for supervision despite her busy schedule. This research would be impossible without her guidance and persistent help. No words could describe my gratitude to her. Only Allah can repay Assoc. Prof Dr. Zailin's good deeds.

Finally, I would like to thank all friends, respondents and everyone who have directly and indirectly help me to complete this thesis in time. Only God could repay your kindness. Thank you very much.

APPROVAL

The Examination Committee has met on **27 October 2020** to conduct the final examination of **Norsuhada binti Isa** on his degree thesis entitled **Relationship of Consumption Pattern on Malaysian Consumer Toward Renewable Energy**.

The committee recommends that the student be awarded the of Master of Science (Resource Management).

Members of the Examination Committee were as follows.

Prof. Madya Datuk Dr. Abdul Rahman bin Abdul Razak Shaik

Faculty of Defence Studies and Management

Universiti Pertahanan Nasional Malaysia

(Chairman)

Dr. Mohd Hamran bin Mohamad

Faculty of Defence Studies and Management

Universiti Pertahanan Nasional Malaysia

(Internal Examiner)

Prof. Mayda Datin Dr. Nor Liza binti Abdullah

Faculty Economy and Management

Universiti Kebangsaan Malaysia

(External Examiner)

APPROVAL

This thesis was submitted to the Senate of Universiti Pertahanan Nasional Malaysia and has been accepted as fulfilment of the requirements for the degree of **Master of Science (Resource Management)**. The members of the Supervisory Committee were as follows.

Assoc. Prof. Dr. Zailin Binti Zainal Ariffin

Faculty of Defence Studies and Management
Universiti Pertahanan Nasional Malaysia
(Main Supervisor)

Assoc. Prof. Dr. Mohd Adib Bin Ibrahim

Solar Energy Research Institute (SERI)
Universiti Kebangsaan Malaysia
(Co-supervisor)

Assoc. Prof. Dr. Aida Nasirah Binti Abdullah

Faculty of Defence Studies and Management
Universiti Pertahanan Nasional Malaysia
(Co-supervisor)

UNIVERSITI PERTAHANAN NASIONAL MALAYSIA

DECLARATION OF THESIS

Student's full name : Norsuhada binti Isa
Date of birth : 8th September 1993
Title : Relationship of Consumption Pattern on Malaysian
Consumer Toward Renewable Energy
Academic session : January 2021

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged.

I further declare that this thesis is classified as:

- CONFIDENTIAL** (Contains confidential information under the official Secret Act 1972)*
- RESTRICTED** (Contains restricted information as specified by the organisation where research was done)*
- OPEN ACCESS** I agree that my thesis to be published as online open access (full text)

I acknowledge that Universiti Pertahanan Nasional Malaysia reserves the right as follows.

1. The thesis is the property of Universiti Pertahanan Nasional Malaysia.
2. The library of Universiti Pertahanan Nasional Malaysia has the right to make copies for the purpose of research only.
3. The library has the right to make copies of the thesis for academic exchange.

Signature

930908-08-6870

IC/Passport No.

Date:

**Signature of Supervisor/Dean of CGS/
Chief Librarian

PM Dr. Zailin binti Zainal Ariffin

**Name of Supervisor/Dean of CGS/
Chief Librarian

Date:

*If the thesis is CONFIDENTIAL OR RESTRICTED, please attach the letter from the organisation with period and reasons for confidentiality and restriction.

** Witness

TABLE OF CONTENTS

| | Page |
|--|-------------|
| ABSTRACT | ii |
| ABSTRAK | iv |
| ACKNOWLEDGEMENTS | vi |
| APPROVAL | vii |
| DECLARATION | ix |
| TABLE OF CONTENTS | x |
| LIST OF TABLES | xiii |
| LIST OF FIGURES | xiv |
| LIST OF APPENDICES | xvi |
| | |
| CHAPTER 1 INTRODUCTION | |
| 1.1 Introduction | 1 |
| 1.2 Background of the Study | 1 |
| 1.2.1 Status of Renewable Energy Sector in Malaysia | 4 |
| 1.2.2 Feed-in Tariff (FiT) Program | 5 |
| 1.2.3 Net-Metering Program | 7 |
| 1.2.4 Large Scale Solar Program | 9 |
| 1.3 Problem Statement | 10 |
| 1.4 Research Question | 14 |
| 1.5 Research Objective | 14 |
| 1.6 Scope of Study | 15 |
| 1.5 Limitation of the Study | 16 |
| 1.6 Significance of the Study | 17 |
| 1.7 Conclusion | 19 |
| | |
| CHAPTER 2 LITERATURE REVIEW | |
| 2.1 Introduction | 20 |
| 2.2 Conceptual Definition of Term | 21 |
| 2.2.1 Consumer Concern | 21 |
| 2.2.2 Consumer Knowledge | 23 |
| 2.2.3 Consumer Belief | 24 |
| 2.2.4 Consumer Acceptance | 26 |
| 2.2.5 Consumer Attitude | 27 |
| 2.2.6 Willingness to Pay | 28 |
| 2.3 Linkages between Independent Variable and Dependent Variable | 30 |
| 2.3.1 Consumer Concern and Willingness to Pay | 30 |
| 2.3.2 Consumer Knowledge and Willingness to Pay | 31 |
| 2.3.3 Consumer Belief and Willingness to Pay | 32 |
| 2.3.4 Consumer Acceptance and Willingness to Pay | 33 |
| 2.3.5 Consumer Attitude and Willingness to Pay | 35 |

| | |
|--|----|
| 2.4 Theoretical Under-pinning | 37 |
| 2.4.1 Theory Reason Action (TRA) | 37 |
| 2.5 Conceptual Framework | 39 |
| 2.6 Research Hypothesis | 40 |
| 2.7 Conclusion | 41 |
| | |
| CHAPTER 3 RESEARCH METHADODOLOGY | |
| 3.1 Introduction | 42 |
| 3.2 Research Design | 42 |
| 3.3 Measurement of Construct | 44 |
| 3.3.1 Measurement Construct for Consumer Concern | 44 |
| 3.3.2 Measurement Construct for Consumer Knowledge | 46 |
| 3.3.3 Measurement Construct for Consumer Belief | 47 |
| 3.3.4 Measurement Construct for Consumer Acceptance | 49 |
| 3.3.5 Measurement Construct for Consumer Attitude | 50 |
| 3.3.6 Measurement Construct for Willingness to Pay | 52 |
| 3.4 Questionnaire Structure and Sequences | 53 |
| 3.5 Research Sampling | 54 |
| 3.6 Sample Size | 55 |
| 3.7 Pilot Study | 57 |
| 3.8 Data Analysis Technique | 58 |
| 3.8.1 Confirmatory Composite Analysis | 60 |
| 3.8.2 Internal Consistency and Reliability | 60 |
| 3.8.3 Convergent Validity | 61 |
| 3.8.4 Discriminant Validity | 62 |
| 3.9 Conclusion | 62 |
| | |
| CHAPTER 4 RESULTS AND DISCUSSION | |
| 4.1 Introduction | 64 |
| 4.2 Research Profile | 65 |
| 4.3 Descriptive Analysis | 66 |
| 4.4 Confirmatory Composite Analysis (Reliability and Internal Consistency) | 64 |
| 4.5 Convergent Validity | 71 |
| 4.6 Discriminant Validity | 72 |
| 4.6 Hypothesis Testing | 73 |
| 4.7 Conclusion | 80 |
| | |
| CHAPTER 5 CONCLUSION AND RECOMMENDATIONS | |
| 5.1 Introduction | 81 |
| 5.2 Overview of the Study | 81 |
| 5.3 Implication of the Study | |
| 5.3.1 Theoretical Implication | 85 |
| 5.3.2 Practical Implication | 85 |
| 5.4 Recommendation for Future Research | 87 |
| 5.5 Conclusion | 93 |

| | |
|--------------------------------|-----|
| REFERENCES/BIBLIOGRAPHY | 96 |
| APPENDICES | 112 |
| BIODATA OF STUDENT | 127 |
| LIST OF PUBLICATION | 129 |

LIST OF TABLES

| TABLE NO. | TITLE | PAGE |
|------------------|--|-------------|
| Table 1.1 | Summary of Literature on Energy Consumer Studies in Malaysia | 11 |
| Table 3.1 | Measurement of Consumer Concern | 45 |
| Table 3.2 | Measurement of Consumer Knowledge | 46 |
| Table 3.3 | Measurement of Consumer Belief | 48 |
| Table 3.4 | Measurement of Consumer Acceptance | 50 |
| Table 3.5 | Measurement of Consumer Attitude | 51 |
| Table 3.6 | Measurement of Willingness to Pay | 52 |
| Table 3.7 | Number of Questionnaire Distributed | 56 |
| Table 3.8 | Internal Consistency Reliability Coefficient | 57 |
| Table 4.1 | Data respondent of the Study | 66 |
| Table 4.2 | Descriptive Analysis | 68 |
| Table 4.3 | Average Variance Extracted | 72 |
| Table 4.4 | Discriminant Validity | 73 |
| Table 4.5 | Path Coefficient | 74 |

LIST OF FIGURES

| FIGURE NO. | TITLE | PAGE |
|-------------------|--|-------------|
| Figure 1.1 | Status of Renewable Energy Capacity | 13 |
| Figure 2.1 | Theory of Reasoned Action (TRA) | 37 |
| Figure 2.2 | Conceptual Framework | 39 |
| Figure 3.1 | Sample Size Determination | 55 |
| Figure 4.1 | Confirmatory Composite Analysis (Reliability and Internal Consistency) | 70 |
| Figure 4.2 | Final Structure | 80 |

LIST OF ABBREVIATIONS

| | |
|-----------|--|
| UPNM | Universiti Pertahanan Nasional Malaysia |
| RE | Renewable Energy |
| FiT | Fit in Tariff |
| NEM | Net Energy Metering |
| LSS | Large Scale Solar |
| Solar PV | Solar Photovoltaic |
| SEDA | Sustainable Energy Development Authority |
| TNB | Tenaga Nasional Berhad |
| TRA | Theory Reasoned Action |
| SPSS | Statistical Package for Social Science |
| Smart PLS | Smart Partial Least Square |
| EFA | Exploratory Factor Analysis |
| CFA | Confirmatory Factor Analysis |
| CCA | Confirmatory Composite Analysis |
| AVE | Average Variance Extracted |

LIST OF APPENDICES

| APPENDIX | TITLE | PAGE |
|-----------------|----------------------------------|-------------|
| Appendix A | Renewable Energy Survey Question | 113 |
| Appendix B | Data Collection on SPSS | 121 |
| Appendix C | Data Analysis on SmartPLS | 122 |

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter consists of seven sections. It is commenced by presenting the background of the study and the overview of Malaysian consumer pattern on renewable energy. The first section explains the background of the study. The second section contains the problem statement of this study whereas the third section stated the research objectives. The scope of this study is explained in the fourth section while the limitation of the study is explained in the fifth section. Then, the significant of the study are shown in the sixth section and the conclusion is elaborated in the last section.

1.2 Background of the Study

There are growing concern among consumers about whether the earth's resources will continue to sustain the standard of living. One of the major sources of consumer concern is related to energy consumption. The consumption of energy representing the power of generation of fossil fuel that contribute for more pollution

as well the energy utilization for daily usage. At the same time, the demand of energy consumption continues to grow which made price increase rapidly.

With the aid of technological innovation to replace traditional energy arrangements to reduce the global warming crisis, renewable energy (RE) is the transformation of natural energy (Ahmad et al., 2014). All the energy sources we are utilizing nowadays can be classified into two bunches: renewable and non-renewable. RE sources are not drained, and it is conveyed over a wide geographical area, these resources are rapidly renewed through the natural process (Nada, 2016). It would not create any emissions issues for the environment. The biggest value of using renewable resources is that they are usable across the year. Via a one-time investment ready for many decades to draw electricity without impacting the climate.

As fossil fuels energy resources dry up and pollution increases, all countries policy makers seek to develop new energy programs that are more environmentally and sustainable. According to Gielan et al., (2019), renewable energy has emerged as a potential alternative energy resource. Currently, Malaysia as a developing country is mainly dependent on fossil fuel such as petroleum, natural gas, and coal. By 2020 Malaysia has become a net importer of fuel and natural gas. Malaysia has also pledged to reduce carbon emission by 40% from the base year 2005 by the year 2020. Way back in 2010, Malaysia New Economic Model already shows that government wants the nation to be able to take a leadership role in the implementation of renewable energy. Amongst ASEAN countries, Malaysia is considered as country that become a leader in implementation and usage of renewable energy. A Business Monitor International (BMI) research in February 2017 place Malaysia among the top three

countries for renewal energy investment after Australia and Singapore. According to Gielen et al. (2019), local air pollution is a main driver in countries such as China and India. But also in Europe, there is increasing attention for the harmful health effects of air pollution, largely related to energy supply and use. The analysis shows that the CO₂ emissions intensity of global economic activity needs to be reduced by 85% between 2015 and 2050. The energy transition must reduce emissions substantially to ensuring that sufficient energy is available for economic growth. Malaysia has an area of 329, 847 km². It is estimated population is 32.6 million people in 2019 (Department of Statistic Malaysia, 2019). There are growing concern among consumers about whether the earth's resources will continue to sustain the standard of living. One of the major sources of consumer concern is related to energy consumption.

Malaysia's renewable sector is gaining momentum following the National Renewable Energy Policy and Action Plan and the government Feed in Tariff (FiT) scheme. Both Federal government and State government and some of private corporations play their roles in moving this country towards its renewable energy goals. For example, the Sabah state government has rejected plans for a new coal fired power plant in 2010 but opened the country's first geothermal power plant to be develop in Tawau in August 2016. Besides that, private corporation such as Berjaya Group who had funded plenty of renewable energy project in past and will continue to do so in the future. Another example, FELDA also is one of the main proponents of biomass energy, which counts as one of our biggest contributors to sustainable energy growth. Malaysia has all the legislation, policies, and incentive in place for renewable energy.

In this study, researcher aim to review the relationship on consumer's concern, knowledge, belief, acceptance and attitude towards RE among Peninsular Malaysians. This research uses the theory of reasoned action as a theoretical framework. It is adapted based on a research conducted by Bang et al. (2000). Alongside, it is a great opportunity to understand the trend of consumer awareness and public interest toward RE technology among existing personnel bill payer in Malaysia. The expected outcome of this research will be beneficial to government bodies, investors and marketers which is useful for current development and future generation of renewable energy in Malaysia.

1.2.1 Status of Renewable Energy Sector in Malaysia

Recognising the benefits and importance of renewable energy, the Malaysian government has adopted several policies and measures to ensure economic, energy and environmental sustainability (Alam et al., 2014). The Malaysian government has introduced several policies and programmes that help to accelerate the usage of solar technology. There were a few key projects implemented in Malaysia since 1999 such as the Malaysia Industrial Energy Efficiency Improvement Project (MIEEP). Small Renewable Energy Power Programme (SREPP), Malaysia Building Integrated Photovoltaic (MBIPV) Technology Application Project, Building Energy Efficiency Programme (BEEP) and Green Building Index (GBI) (Chua & Oh., 2010) (Oh et al., 2013). For last decade of solar programme implemented in Malaysia were FiT scheme, which introduced during first drafted of the Renewable Energy Act on 15 December 2010, followed by Net-Metering in 2016 and Large-Scale Solar in 2016. The great effort of the comprehensive various RE schemes has increased the RE

contribution from <1% in 2009 to 5.5% of Malaysia's total electricity generated in 2015.

1.2.2 Feed-in Tariff (FiT) Program

The FiT implementation in 2011 provides alternative energy supply from RE resources, which is sufficient to support the nation's economic aspirations by 2020. The four RE resources are eligible under FiT scheme that includes biogas, biomass, small hydropower, and solar PV. Implementation of FiT) as a solution is a better decision for the supply of energy from sustainable sources in preparation for the country entered a period of growth towards a high-income economy. The FiT scheme under the RE Act provides each qualified individual residential or companies is entitled to sell electricity generated from RE sources of energy to power utility firm of Tenaga Nasional Bhd (TNB) at a specified price within a certain timeframe.

The FiT addresses two primary economic issues faced by many countries such as United States, European Union, Canada, Germany and Japan (Linden et al., 2014) such as employment and gross national income via RE industry growth. The two secondary issues addressed by FiT are energy security and climate change mitigation. The FiT also provides solutions to tertiary issues concerning social health, empowering and providing fairer wealth distributions to citizens and the community, and environment conservation. All this is achieved without putting a strain on the Government's budget and spending. There are some of the economic, political, social and environmental advantages of the FiTs (Ministry of Energy, Green Technology and Water Malaysia, 2011).

In economic perspective, the FiTs give benefits on green jobs creation, Foreign Direct Investment (FDIs) and Domestic Direct Investment (DDIs) for manufacturing and export, hedge against conventional fuel price volatility and drive economic development by provide RE investor security and create stable conditions for market growth. Besides that, the FiTs also give advantages on political and social such as demonstrate commitment to RE deployment, increase energy security and autonomy, promote a more decentralized and democratized form of electricity system, increased public support for renewables through direct stake and increased exposure to renewables and encourage citizen and community engagement in activities protecting climate and environment. The FiTs also give advantages for environmental because its help in reduce carbon emission and pollutions and encourage energy efficiency measures.

Along the side, there are many disadvantages of FiTs implementation. The main challenge with FiT is many factors affect pricing where this hard to keep up with changes in cost of renewable energy systems, other incentives available (Couture et al., 2010). FiT schemes without digression have proven to have a rather slow reaction time to rapid changes in RE costs (e.g., the cost reductions of photovoltaic systems during the past few years). Even if there is a digression mechanism, the digression might be set at a level that does not reflect the actual development of RE costs. FiT also do not provide any incentive for RE operators to respond to price signals of the electricity market. Therefore, FiT schemes do not allow for an effective market integration of RE.

As part of the promotion FiT, since September 2012 SEDA have been offered Rooftop Solar Home program for 2000 residential of landed homes to increase the involvement of people to install solar PV (Ministry of Energy, Green Technology and Water, 2013). However, about 52% of RE from 985 MW RE can only be achieved by the year 2015 (1st RE target) with 205.81MW (40%) using solar PV application. Although only 52% from the target achieved but it expected to be achieve through RE capacity growth under RE Policy and Action Plan (2010) in 2020 and 2030, with 2,080MW and 4,000MW. The accumulative of RE capacity target is very challenging and should be comparing by the continuous public consciousness, willingness and adaptation towards RE technology. Alongside, it is a great opportunity to understand the trend of consumer awareness and public interest toward RE technology among existing personnel bill payer in Malaysia.

1.2.3 Net-Metering Program

Net-metering is commonly known as a practice by which owner of distributed generation units may offset their electricity consumption from the grid with local generation. The increasing number of consumers (consumers that both produce and consume electricity) with solar PV generation combined with net-metering results in reduced incomes for many network utilities world-wide (Eid et al., 2014).

The idea for net energy metering (NEM) is the energy that generated from sun oriented that solar PV system installed will be consumed first, and any excess to be exported and sold to the distribution licensee (such as TNB/SESB) at the prevailing Displaced Cost prescribed by the Energy Commission (SEDA). This plan may be appropriate to all domestic, commercial and industrial sectors who take part as