Contents list available at IJRED website

International Journal of Renewable Energy Development

Journal homepage: https://ijred.undip.ac.id

Research Article

Public Support for Feed-in-Tariff and Net Energy Metering Policies in Malaysia: The Role of Policy Information

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Abstract. Renewable energy (RE) policies have proven to be an effective tool for implementing RE. Despite various policies introduced, the RE deployment in Malaysia has been weak, especially individual RE uptake. Lack of policy support has been linked with inadequate policy awareness and information based on the knowledge deficit theory. This study investigates the support for the Feed-in-Tariff (FiT) and Net Energy Metering (NEM) policy of individual solar photovoltaic (PV) technology among landed residents in Malaysia and the effect of information provision on policy support. A Solomon-four-group design was employed to measure policy support and test the relationship between information provision and policy support using a set of Likert scale questionnaires and a poster of FiT and NEM policy prepared in layman's terms as an intervention. Results show that majority of the residents agree with the environmental mission of the policy, except for the reduction of fossil fuel usage. For the economic aspect, the residents prefer a fixed rate for RE produced and generally agreed that high electricity consumers should pay for the RE fund. However, residents were less enthusiastic about the percentage deducted from electricity bills and the 'high electricity consumer' baseline. There was a significant difference between items scores at pre and post-test when given the intervention, in line with the deficit theory. Therefore, policy information should be communicated strategically, focusing on thepolicy's social and economic components that have the greatest influence on Malaysians.

Keywords: Policy support, Solomon four-group design, information provision, solar PV, Feed-in-Tariff, Net Energy Metering

Received: 17th Feb 2022; Revised: 14th April 2022; Accepted: 18th April 2022; Available online: 26th April 2022

1. Introduction

Fueled by industrialisation and urbanisation, global energy consumption is expected to double between 2018 and 2050, with Asia leading the charge (IEO, 2019). With this increase, current non-renewable energy resources will likely deplete, and renewable energy (RE) resources are considered the solution to address climate change and the transition towards zero-emission (Marks-Bielska *et al.*, 2020; Rowley & Westwood, 2003; Sagar, 2021).

RE policies have been an excellent tool for successful RE deployment (Frondel *et al.*, 2015; Liu *et al.*, 2020; Sangroya & Nayak, 2015; Stokes & Warshaw, 2017). Many policy measures to encourage RE adoption are gaining traction and being documented in the literature, especially in the EU countries and the United States (Kilinc-Ata, 2016). In contrast, RE adoption in newly industrialised countries (NIC) whose economic development has surpassed that of developing countries but has not yet been classified as developed nations (Destek & Okumus, 2019) is an important area and less explored. This is because, in the pursuit of economic growth, the NIC has seen a surge in energy consumption over the last two decades, with investments being made for an industrial paradigm shift that replaces agricultural exports with technologically advanced products (Cui *et al.*, 2019; Shahzad *et al.*, 2021).

Numerous studies have also linked policy success to policy support (Liu *et al.*, 2020; Stokes & Warshaw, 2017; Zverinova Iva *et al.*, 2013) and that this support is based on policy awareness and environmental concerns. (Rhodes *et al.*, 2014). However, research on policy awareness compared to policy support differs significantly. Mere awareness of a policy is not enough to translate into support. Rhodes *et al.* (Rhodes *et al.*, 2014) suggest that knowledge of climate policy is beyond the grasp of all but experts and the most keenly interested citizens, even when certain climate policies are designed specifically for the involvement of the public.

As RE resources are an integral part of meeting many national decarbonisation strategies, public understanding

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https://doi.org/10.14710/ijred.2022.44820
ISSN: 2252-4940/© 2022.The Author(s). Published by CBIORE

of the advantages of RE in CO^2 reduction as well opportunities to become energy independent can influence public support and the efficacy of RE policies through lesser objection and increased uptake in homes (Gastaldo *et al*., 2019; Gurtner & Soyez, 2016; Heidari *et al*., 2020). This raises important questions about the citizens' support for the policies and how information might affect public support.

Among the countries listed under the NIC, Malaysia is an emerging economy with high energy demand per unit of GDP, developmental needs, and fossil resources sufficient to allow net energy exports (Shahzad *et al*., 2021). The Malaysian Government has revised the RE target under the National Renewable Energy Policy targets of 20% RE share in the electricity generation mix by 2025, to 31%, and 35% by 2035 (Hin & Chiah, 2021). This target is ambitious since all the previous RE targets set by the government have not been reached (SEDA, 2016, 2019). Solar energy was identified as the leading RE to focus on since it has the highest potential in Malaysia (Hin & Chiah, 2021). Few scholars have studied support for renewable energy in Malaysia (see works by (Jayaraman *et al*., 2017; Kardooni *et al*., 2016; Solangi *et al*., 2015), but to our knowledge, no case study on RE policy acceptance in Malaysia is currently published. Although Kardooni *et al.* (2016) found that the public is adequately informed on climate matters, the majority believe the installation cost is high, which reduces acceptance. They also found that public knowledge of policies is low.

This paper explores specific aspects of the policy support by investigating the current policy support and the effects of information provision on policy support using the Feed-in-Tariff (FiT) and Net Energy Metering (NEM) individual solar policy in Malaysia as a case study. This paper's main objectives are to first assess the public support for individual solar Feed-in-Tariff and Net Energy Metering policies and, secondly, to investigate the influence of information provision on the policy support.

1.1. The knowledge deficit model

Conflicts over public policy and science are frequently linked to a lack of understanding among citizens, which scientists refer to as a knowledge gap between citizens and experts, sometimes known as a "knowledge deficit."

The knowledge deficit model introduced in the 1980s by social scientists can be summarised in two main ideas. The first is the assumption that public scepticism and confusion about modern science, particularly environmental challenges, and technology, is primarily due to a lack of knowledge about science and related disciplines. The second aspect is the idea that by providing adequate information to overcome this lack of knowledge, also known as a "knowledge deficit," the general public's opinion will change, and they will decide that the information provided on the environment and science, in general, is reliable and accurate (Brunk, 2006; Rhodes *et al.*, 2014; Stoutenborough & Vedlitz, 2014). There have been many attempts to increase public support of policies based on the claims of the knowledge deficit model by expanding the availability of policy knowledge using social media, brochures, town hall meetings, radio and television shows, public lectures, scientific reports, documentaries, and even films (Fletcher *et al*., 2020; Mavrodieva *et al*., 2019; Sola, 2014).

However, the deficit model has been critiqued by a plethora of research that shows that merely providing individuals with additional information does not necessarily change their minds. In reality, the reasoning is complex and attempts to disprove false information typically fail (Lewandowsky *et al.*, 2012). Science communication fails not because laypeople don'tunderstand the scientific facts but because scientists don'tunderstand and appeal to the audience's underlying beliefs (Seethaler *et al*., 2019). Policy support can increase by providing the policy details and explaining the policy's rationale and social benefits (Shi *et al*., 2013).

Even so, the deficit model continues to be an essential part of environmental education and practice. The absence of a solid empirical study supporting the knowledge deficit model and the disparity that arises from past research raises the question of whether providing policy knowledge will affect policy support. To our knowledge, the present study is the first to measure the acceptance of the FiT and NEM policy items and measure the relationship between policy information and policy support.

1.2. Policy support for renewable energy policies

The concept of policy support for RE is interesting because the goal of the environmental policies is usually for the sake of the environment shared by everyone in the community, state, or country, and any support or rejection of environmental policies can significantly influence others.

Published literature identified several factors influencing public support for RE policies, with most leading works in Europe and the United States. Among the most highly reviewed is the FiT program, which is unique in each country and state (in the case of the US). We can classify these factors into three main domains: attitudinal, contextual, and personal capability (Sobri *et al*., 2021). The attitudinal factors found to affect RE policy support are environmental concerns (Braito *et al*., 2017; Chen *et al.*, 2016; Simpson & Clifton, 2017) and personal norms (Braito *et al*., 2017; Briguglio & Formosa, 2017; Lasco & Chernyakhovskiy, 2017). For contextual variables, the main factors identified are economic such as willingness to pay, government incentives, and investment opportunity (Fleib *et al.*, 2017; Klein & Deissenroth, 2017; Mignon & Bergek, 2016), trust in the governing body and solar retailers (Briguglio & Formosa, 2017; Lasco & Chernyakhovskiy, 2017), and homeownership (De Groote *et al.*, 2016; Fleib *et al*., 2017). Lastly, personal capability includes the socio-demographic of the citizens, such as age and income (Briguglio & Formosa, 2017; De Groote *et al.*, 2016).

1.3. Individual solar policies in Malaysia

There are two main RE programs administered under SEDA, which is the FiT and NEM program. Both programs are policy instruments that have been used worldwide for the deployment of RE technology (IEO, 2019; IRENA, 2018). In Malaysia, FiT was first introduced in 2011 and was available commercially until 2015. By the start of 2016, NEM program was introduced to complement the FiT. Two more programs were introduced which is Self-consumption (SELCO) and Large-Scale Solar (LSS) in 2018 (SEDA, 2019), but is not included in this study as LSS is specifically for industry while SELCO is relatively new, and the features have not been introduced during the data

collection process for this research. It is important to note that the FiT and NEM schemes differ among countries based on the tariff rate and specifications made by the countries governing bodies.

I. Feed-in Tariff

FiT is a policy scheme that allows RE producers to be paid a set rate (tariff) for each unit of electricity fed into the grid, and generally obliges the power companies to purchase all the electricity from eligible producers in their service area over a long period of time usually 15 to 20 years (Chua *et al.*, 2011; David Jacobs, 2010). The FiT program in Malaysia covers five major RE resources: solar PV, biogas, biomass, and small hydro (KeTTHA, 2011). The quota for commercial solar PV installation under the FiT has already been filled and no more application can be made since 2016. To compensate this, the NEM program was introduced for the commercial market, especially for individual solar applications under SEDA.

II. Net Energy Metering

The concept of NEM, on the other hand, is that solar electricity producers will consume first the generated electricity. Any excess will be exported back to the grid and sold to the power companies (such as Tenaga Nasional Berhad) at the prevailing displaced cost by the Energy Commission (Razali *et al.*, 2019; SEDA, 2017). This program is made available to all domestic, commercial, and industrial sectors if they are TNB customers in Peninsular Malaysia. The energy generated from NEM consumers will be consumed first, which implies less energy imported from the utility. The more energy generated from the solar PV system is self-consumed, the more NEM consumers can save their electricity bills (by reducing the electricity imported from the utility (SEDA, 2017). This is especially relevant for consumers that fall under the high electricity tariff block.

2. Methods

The present study employs a Solomon-four-group quasi-experimental design developed by Solomon in 1946 to overcome pre-test sanitisation that can occur in a standard pre-test post-test experimental design (Frey, 2018). The groups were categorised based on whether the respondents received the intervention (treatment) or not (control) and on the number of times, the group answered the questionnaire. Group C1 and T1 respondents had to answer the same questionnaire twice (2 weeks gap) with no intervention, while group T1 with intervention. For groups C2 and T2, the respondents only had to answer the questionnaire once but group T2 was given the intervention prior to answering the questionnaire (see Table 1). To be as close as possible to a true experimental design where variables are controlled, respondents' characteristics were maintained to prevent biases.

Table 1
Solomon four-group design

Groups	Pre-test	Treatment	Post-test
C1	X		x
T1	X	x	x
C2			x
T2		x	x

The participants are landed home residents in Peninsular Malaysia. Purposive sampling was used to select respondents as the study design involves criterion sampling (Frey, 2018). However, random assignment was used to allocate groups using a random number generator to assign each respondent to the four groups. The measure for inclusion criteria were respondents aged between 31-40 years, have a bachelor's degree education level with an income between RM3860.00-RM 8319.00 (M40), and have an electricity bill of higher than RM77.00. The age group and income level were selected as it was the group to be highly affected by electricity payment. In contrast, the electricity bill of more than RM 77.00 criteria was chosen as it involves citizens whose electricity bill is no longer highly subsidised by the government.

After selecting the study samples according to the inclusion criteria, respondents were divided into two control groups (C1 and C2) and two treatment groups (T1 and T2) randomly, and a pre-test was administered in two groups (C1 and T1). The test was collected using a pre-designed Likert scale questionnaire of 15 items measuring policy support. All the questionnaires were adapted following the FiT and NEM scheme in Malaysia, validated, and pre-tested. (Cronbach alpha 0.887). Data collection was done face-to-face on an online survey sheet using Google Form to reduce paper wastage and blank feedback. All the respondents were given a consent form and a brief introduction to the study and its primary objective. During the data collection, respondents from T1 and C1 were informed to be prepared for a follow-up survey the following week via email and were incentivised using gift brochures. The following week, all groups filled the post-test questionnaire, with groups T1 and T2 receiving the treatment before answering the questionnaire set.

The treatment involves a one-page poster of the differences and similarities between the FiT and NEM schemes in Malaysia. All statistical analysis was performed using IBM SPSS Statistics.

2.1 Policy support for Feed-in-Tariff and Net Energy Metering

Respondents were required to rate their support for certain policy elements in FiT and NEM for individual solar technologies. For this section, 15 items with a five-point scale ranging from “strongly disagree” to “strongly agree” with an option of “neutral” were used (appendix a). There are four core themes found in the questionnaire set for the policy support section: the environmental, economic, social, and technical aspects of the policy. For the environmental aspect, respondents were asked on their support for policies that generally show environmental concern, like policies that could reduce carbon footprints, reduce reliance on fossil fuels, increase RE instalments and increase public engagement in protecting the environment. In terms of the economic aspect, questions were more on the technical side of the FiT and NEM policy like RE tariff rate, RE fund (who pays for the fund?), the charging percent for high electricity users to fill RE fund, and the opportunity to sell electricity produced to distributing licensee, in this case, the electrical company in Malaysia, Tenaga Nasional Berhad (TNB). For the social aspect, questions on who should be able to apply the policy were questioned. Lastly, the technical aspect of the

policy like slot allocation and transparency of quota and installation process. The questions were a mixture of both FiT and NEM characteristics, and the questions were not organised in a way that the respondents would know which item belongs to which policy. Respondents were also not given any explanation on the items and had to answer the questionnaires based on their current knowledge and what was stated in the questionnaire. This procedure prevents biases in data and will give more accurate results for the next part of the study, the effect of information provision. Both policy support before and after receiving treatment is analysed.

2.2 Information provision as treatment

Information regarding the policy was given to both treatment groups (T1 and T2). The information was organised strategically in an informative poster to explain only the FiT and NEM policy for individual solar producers (appendix b). The treatment is given one-off, and the respondents are given a chance to ask questions if needed clarification of the poster. The poster was explicitly arranged to show the differences and similarities of the two solar policies. The respondents can evaluate themselves the advantage or disadvantages of each policy. The general language used was also in layman terms that allow the respondents with the slightest knowledge on the policy to grasp the meaning of the policy. The poster briefly explains the policy, the returns (monetary or credits), the returns process, the tariff rate per kWh energy produced, the amount of CO2 saved when using solar energy, and the managing body and utility in charge.

To assess the effect of information provision, both descriptive and inferential statistics were used. Frequency analysis is used to determine the level of support before and after providing policy information. Inferential statistics were also used to determine if providing policy information is associated with a statistically significant change in citizen support for FiT and NEM policies. Specifically, a dependent sample t-test was used for the groups at pre-test and post-test.

3. Results and Analysis

3.1 Policy support for Feed-in-Tariff and Net Energy Metering

Policy support for FiT and NEM was measured by analysing the groups that did not received any treatment which are group C1, C2, and T1 (at pre-test). Comparisons between two groups using t-test analysis showed that all groups were not significantly different for any items (Table 2) signalling a uniform data. Thus, data from the three groups at pre-test was used to analyse policy support for FiT and NEM in Malaysia.

Table 2
t-test results at pre-test

t-test	Results Sig (2-tailed)
C1 and T1	All items p> 0.05
C1 and C2	All items p> 0.05
C2 and T1	All items p>0.05

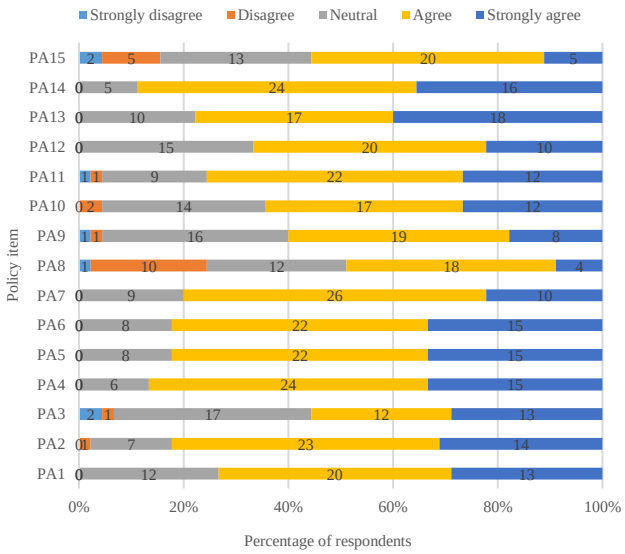

Fig 1. Percentage of resident support for policy items before intervention

Figure 1 shows the percentage of support for all policy items address in this study. The questionnaire items are supplied in appendix a. For policy items that measure environmental aspects (PA1, PA2, PA3, and PA4), the vast majority of the respondents were found to be interested in reducing the carbon footprint (73%) and increasing RE instalments in Malaysia (82%), but less enthusiastic about reducing the reliance of fossil fuels for electricity generation where 38% of the respondents were neutral, and only half (56%) were in favor for the policy item. When asked how they felt about policies that can increase public engagement in protecting the environment, support was higher with 86% supporting the policy item.

For policy items involving the economic aspect of the FiT and NEM, respondents generally agree to have a fixed rate for the RE produced, signaling that a volatile electricity price is not favorable. Respondents were also largely supportive for the how and who funds for the RE payment, but less favorable for the percentage surcharge to the consumers with 51% neutral or against the policy item. This might also not mean the percentage in general, but the respondents not agreeing to all electricity consumers to charge a certain amount to fill the RE fund as when asked if only consumers that use more than 300kWh per month, to be charged, 60% of the respondents agree to the policy item. This was also supported by the majority (80%) supporting item PA7, of only high electricity consumers to pay in the RE fund.

The respondents also favoured policy fairness and transparency, where P12 and P13 were supported. Only for item P15, where respondents were asked their support on a policy that only allows citizens with homeownership to install solar PV, did not receive high support.

3.2 Relationship between information provision and policy support

The findings showed that at the pre-test comparison of policy acceptance, the dependent variable of the three groups was similar where there was no significant difference in item scores.

Table 3
t-test analysis at pre and post-test for T1

Items pairing	Mean	N	t	Sig. (p-value)	Null hypothesis *
PA1_A	4.4667	15	2.646	0.019	Reject
PA1	4.1333	15			
PA2_A	4.6667	15	3.228	0.006	Reject
PA2	4.1333	15			
PA3_A	4.4667	15	4.036	0.001	Reject
PA3	3.7333	15			
PA4_A	4.4667	15	2.092	0.055	Accept
PA4	4.1333	15			
PA5_A	4.3333	15	2.092	0.055	Accept
PA5	4.0000	15			
PA6_A	4.4000	15	3.055	0.009	Reject
PA6	4.0000	15			
PA7_A	4.6000	15	3.500	0.004	Reject
PA7	4.1333	15			
PA8_A	4.1333	15	4.525	0.000	Reject
PA8	3.2000	15			
PA9_A	4.4000	15	3.154	0.007	Reject
PA9	3.8000	15			
PA10_A	4.2000	15	2.449	0.028	Reject
PA10	3.8000	15			
PA11_A	4.4667	15	3.666	0.003	Reject
PA11	3.6000	15			
PA12_A	4.4667	15	4.000	0.001	Reject
PA12	3.9333	15			
PA13_A	4.5333	15	2.092	0.055	Accept
PA13	4.2000	15			
PA14_A	4.1333	15	-0.564	0.582	Accept
PA14	4.2000	15			
PA15_A	3.5333	15	0.323	0.751	Accept
PA15	3.4667	15			

*Null hypothesis: There is no significant difference between the means at pre-test and post-test item scores

This similarity and equality of the groups have allowed for the interpretation of the results obtained at the post-test level between groups C1 and T1 to assess the effectiveness of intervention (policy information). The post-test comparisons allow for the deduction of the effect of the intervention on the respondents.

A dependent sample t-test analysis was used to assess the relationship between information provision and policy support. Table 3 indicates a comparison between the scores obtained for respondents in T1 at pre-test and a post-test, in which these respondents have received the intervention (information on feed-in-tariff and net energy metering policy). The analysis intends to test the null hypothesis that there is no significant difference between the item scores before and after the intervention. The table shows most items, when answered before and after the intervention, had significant differences between item scores with P-value < 0.05. Only 5 out of 15 items were found to have no significant difference between the pre and post-test scores. Three items had a p-value of 0.055, and the other two items were highly insignificant at 0.582 and 0.751 for item pairings 14 and 15, respectively.

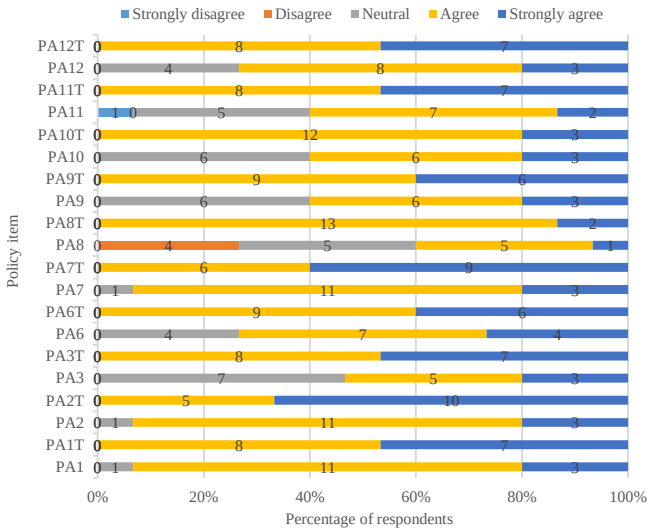

Fig 2 Percentage of resident support for policy items before and after intervention

A dependent sample t-test for group C1 was also done to check for pre-test sensitisation. All item scores found that there was no significant difference between groups, proving that respondents did not change their overall response when not given any treatment (policy information).

3.3 Effect of information provision and policy support

Figure 2 shows the level of support for FiT and NEM policies before and after receiving information about the policies. After receiving the policy information, respondents' support showed an overall increase. A notable difference can be seen in item PA3, where policies that reduce the reliance on fossil fuels were more favourable, from 45% neutral for the policy item to all the respondents who agree or strongly agree the item PA3T. Another notable difference is seen for item PA8 (charging 1.6% of total electricity bill to fill RE fund), where at pre-test, 28% disagreed with the policy and 30% were neutral. On the other hand, at the post-test (PA8T), 85% of the respondents agreed with the policy item, while the remaining strongly agreed. Few other items that showed changes from neutral to agree are for items PA9, P10, and PA11.

4. Discussion

4.1 Policy support for FiT and NEM

Environmental-related policy items were discovered to be generally shared by the respondents. The respondents favoured a scheme that would lower Malaysia's carbon impact while also increasing RE instalments. This finding is consistent with research conducted in Malaysia, such as a study by Kardooni et al. (2016), which indicated that the majority of Malaysians (69.75 %) are concerned about climate change, and 61% are concerned about global warming. As a result, the current study's findings add to the body of literature indicating that Malaysians are reasonably knowledgeable of and concerned about the environment.

However, the findings also reveal that respondents are less supportive of policies that restrict the use of fossil

fuels (PA3). This result means that the residents wanted to support environmental causes, but not at the expense of their financial well-being. In this case, a policy that reduces reliance on fossil fuels will mean a change in the current electricity pricing, which is relatively cheap for certain households due to price regulation by the Energy Commission (EC). These findings align with the works by Zulkifli & Aslam (2015), who found that the public in Perlis (a small state in the northern region of Peninsular Malaysia) feel that adopting renewable energy will raise their electricity prices, which they are unwilling to sacrifice.

Meanwhile, for items of the economic aspect, the residents were seeking stability in electricity prices, and the majority agree with the financial part of both FiT and NEM in electricity generator payment. Residents supported the idea that high electricity (Zulkifli & Aslam, 2015) consumers should pay more or its dual principle, i.e., polluter's pay concept whereby those who pollute the most pay the most to the RE Fund. This is one of the concepts for RE deployment in Malaysia that has been pushed by SEDA as means to supply the RE fund and appease the electricity consumers. It is a preferred mechanism because it encourages electricity consumers to make conscious efforts to reduce their electricity consumption by adopting energy-efficient measures/ways of life. This concept has been successful in countries that have adopted it, typically in the form of carbon taxes in the industrial sector (Dreyer & Walker, 2013), as well as public acceptance of the concept (Yuan *et al.*, 2011). People in Germany, on the other hand, are less receptive of the payment plan, which has resulted in the phase-out of the FiT programme and a switch to a bidding system to lower the burdens of electricity on German consumers (Frondel *et al.*, 2015; Strunz *et al.*, 2016).

On the other hand, the study findings reveal less support for the percentage of electricity bill deduction and the baseline for homes subject to the RE fund rate. The mandatory 1.6 percent surcharge on electricity bills for all TNB electricity customers who spend more than 300kWh per year is also less supported. This result could have a number of causes. The first is that members of the M40 community (who make up the bulk of respondents in this survey) may utilise more than 300 kWh per year and so be affected by this regulation. This assumption is based on Ahmed *et al.* (2017)'s study of 348 Malaysians, which indicated that the average domestic electricity use was 345 kWh per month, implying that the average household is charged a 1.6 percent surcharge on their electricity bill. Second, the respondents are uninformed of this policy issue and are even unaware that their current electricity bill includes a 1.6 percent surcharge to the RE Fund. The third explanation is that the rise in fees is unpopular with respondents (just a 1% surcharge was imposed during the early stages of the FiT programme (Chua *et al.*, 2011). This finding is consistent with Azlina *et al.* (2018) findings, who investigated the willingness to pay (WTP) for the 1.6 percent surcharge in Malaysia and found that 66.91 percent of respondents did not agree with the fee for the RE Fund.

The findings also show that policy fairness and transparency during the bidding and quota distribution processes are favourable. Similarly, Firestone *et al.* (2020) observed that public views of procedural fairness can help policy efforts gain popular support. Only 4% of respondents disagreed with the idea of enabling power consumers with Malaysian citizenship to qualify for solar programmes. This results probably is since they are Malaysian citizens who benefit from the privileges that come with citizenship. The support for policies that limit people's capacity to install solar PV to those who own a home was the last policy measure. Residents favoured this item by a margin of about 63%. Because the respondents were both homeowners and tenants, this outcome was surprising. Tenants are not eligible for policy benefits because they do not own a home. The tenants that replied seemed worried about missing out on the FiT or NEM, thus, this outcome was unexpected. One possible explanation for this is that the responders who are tenants have no immediate plans to install solar PV (Sobri *et al.*, 2021).

4.2 Effect of information provision on policy support

The research findings showed that at the pre-test comparison of policy acceptance, the dependent variable of the three groups was similar where there was no significant difference in item scores. This similarity and equality of the groups have allowed for the interpretation of the results obtained at the post-test level between group C1 and T1 to assess the effectiveness of intervention (policy information). The post-test comparisons allow for the deduction of the effect of the intervention on the respondents.

The major findings from this experimental research design are the effect of information provision on policy acceptance, as there was indeed a significant difference between the item scores that received the intervention at pre and post-test. Most of the items show higher support after receiving the intervention. These findings support the knowledge deficit theory where the public's failure to agree on the best available scientific evidence results from simple unfamiliarity with facts, and it assumes that simple communication can help dispute public uncertainty.

There may be several explanations for the positive intervention effect for the present study. Firstly, the target respondents were people from non-related backgrounds, and the information provided was simple and easily understood. From this, the knowledge of the two policies might be just enough to intrigue the respondents to understand and familiarise themselves with the policies. Furthermore, compared to supplying only the factual part of the policy, information that is more relatable and speaks to residents, like the environmental mission of the policy as well as the investment opportunity available showed a positive response from the residents. As policy information becomes available to the residents, a sense of familiarity and excitement of new knowledge could affect the answers at post-test as respondents are likely more prone to accept a policy with which they are familiar (M. Li & Zhao, 2017).

Upon a closer look, the current study uncovered five of the policy items studied had shown no improvement after given intervention. It can be observed that the initial policy components were already accepted and considered favourable, as for the case of items PA4, PA5, PA13, and PA14, with a mean value of around 4.0. Item PA14 and PA15 are self-explanatory. The question asked if the respondents accept a policy that only allows a person with Malaysian citizenship to apply and a policy that will enable a person with homeownership to apply. The mean value was very close for both items before and after the

intervention. For item 15 (a policy where only a person with homeownership can apply) had a mean value of 3.5333 and 3.4667 for post and pre-test, respectively. This shows that the respondents were still unsure of that particular policy component. This might be due to not all of the respondents owning a home and will surely miss out on this policy if they intend to install solar panels at home.

Items that deal with environmental issues (items 1-4) showed good improvement in the post-test study. This result comes as a surprise as intrinsic values are harder to change (Li *et al*., 2019). The arguments that climate science and climate policy are simply too complex and distant from everyday lives for people to invest time (Lorenzoni & Pidgeon, 2006) do not hold in this study. The respondents are more inclined to agree with the FiT and NEM policies when given information on the policies' aim to help reduce GHG emissions and produce a cleaner energy supply. This result might also be to the language and presentation of the intervention that is easy to be understood.

For items that deal with economic aspects of the policy, the overall outlook also showed better improvement when given information on the FiT and NEM policy. The treatment (appendix b) explains the price of solar energy, the possible return of investments, and the funds to pay solar producers, instils confidence in the respondents to accept the policy as it is now seen as a better investment plan and a good bargain. The FiT scheme specifically was drawn to attract residential solar producers economically. Because of this, the FiT scheme is a lot more advantageous to solar producers. Having said this, the government finds that the scheme is not feasible in the long run. The NEM scheme is more feasible and can be maintained for a longer time. The currently available scheme for residential is only the NEM scheme. However, the respondents are not aware of this fact. The treatment only provides information on both types of schemes for the respondents to see. In terms of the economic aspects, the results show a higher affinity towards the characteristics of the FiT scheme.

4.3 limitations of the study

There are at least three limitations in this study. First, data collection at the first and second stage were self-administered via Google Forms, but the first phase allowed respondents to interact with the researcher face to face, whereas the second phase did not. Because the question-answering setting has changed in this method, some essential unknown dimensions may be overlooked. Secondly, the study's researcher created the intervention used in this experimental study after a thorough review of the FiT and NEM policies about information that would be useful based on the research topic and study purpose. This treatment was created to provide information on the policies simply and concisely that anyone could understand, regardless of their background. There is a possibility of bias because the intervention introduced was designed to persuade policy acceptance. Nonetheless, content validity was performed with experts in the field before performing administration, and changes were made following their recommendations. Lastly, policy information is a broad topic, and policy knowledge can be conveyed in various formats. Because the goal of this study was more to inform the respondents than to educate them, the information provided may have a lower impact on their attitudes than, say, an education program led by trained professionals

5. Conclusions

It is crucial to consider policy knowledge from the standpoint of the public or the policy's subjects because this reveals how citizens understand and perceive the policy and how they react to it. The paper examines the current support for solar FiT and NEM policy among residents in Peninsular Malaysia and tests the effect of providing policy information to policy support. The main conclusions are as follows; Firstly, residents are overall supportive of both the FiT and NEM policy even without any information regarding the policy given. Residents were found to be both supportive of RE policy and less supportive of carbon tax policy, suggesting support for environmentally safe measures as long as it does not impact them financially. Secondly, policy information increased policy support and even changed the residents' economic fear of installing solar PV at homes. The initial fear of upfront installation cost was replaced with an investment opportunity after receiving policy information. Based on the main findings, the paper suggests that policy information should be disseminated strategically with more emphasis on the social and economic aspects of the policy that have more impact to the residents. The success of RE policy can only be achieved if the policy information is communicated to the public in a way that speaks to the interest of the public.

Acknowledgments

We would like to thank Universiti Putra Malaysia for funding this research under the Putra Graduate Initiative (IPS) Grant, award no GP-IPS/2018/9608700

Author Contributions: F. Sobri.: Conceptualisation, methodology, formal analysis, writing—original draft, Mariani. A., A.Hamzah, A. Radzi; supervision, resources, project administration. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded under the Putra Graduate Initiative (IPS) Grant, award no GP-IPS/2018/9608700

Conflicts of Interest: The authors declare no conflict of interest.

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Appendix a

Measurement item for policy acceptance construct and policy source

Code	Item	Rule	Policy source	Related instruments
PA1	A policy aiming to reduce carbon footprint	Policy Objective (2) (4)	National Renewable Energy Policy & Action Plan (2009)	FiT and NEM
PA2	A policy to increase renewable energy instalments in Malaysia	Policy Objective (2) (1)	National Renewable Energy Policy & Action Plan (2009)	FiT and NEM
PA3	A policy that reduces reliance on fossil fuel generated electricity	14. (i)	Energy Commission Act 2001 (Act 610)	FiT and NEM
PA4	A policy that enables citizen engagement in protecting the environment	N/A	N/A	FiT and NEM
PA5	A policy with a fixed rate per kWh of RE produced	17 (3) / 17 (6)	Renewable Energy Act 2011 (Act 725)	FiT
PA6	A policy that pays renewable electricity generators from domestic electricity consumers (RE fund)	Section 23 (2)(b)	Renewable Energy Act 2011 (Act 725)	FiT
PA7	A policy that only charges high electricity consumers to pay in the RE fund	3. (1) (a)	Renewable Energy (Allocation from Electricity Tariffs) Order 2011	FiT
PA8	A policy that charges an increase of 1.6% from the electricity bill of electricity consumers to fill the RE fund			FiT
PA9	A policy that charges only those with electricity usage of more than 300kwh a month to fill the RE fund			FiT
PA10	A policy that allows self-solar generated electricity to be consumed first, before being exported back to the grid.	4	Guidelines Solar Photovoltaic Installation on Net Energy Metering Scheme	NEM
PA11	A policy that ensures all applicants be able to sell excess electricity to the grid	5. (2) (b)	Renewable Energy (Renewable Energy Power Purchase Agreement) Rules 2011.	FiT
PA12	A policy that ensures a fair chance of getting slots to become a solar energy generator	3.3.5 (b)	Guidelines and Determinations of the Sustainable Energy Development Authority Malaysia	FiT and NEM
PA13	A policy that ensures the whole process of installation is transparent	7.1.1 (4)	National Renewable Energy Policy & Action Plan (2009)	FiT and NEM
PA14	A policy that only allows citizen of Malaysia to apply for residential solar electricity schemes	Section II 3 (a)	Renewable Energy (Feed-In Approval and Feed-in Tariff Rate) Rules 2011	FiT
PA15	A policy that only allows citizen with home ownership to install solar PV			

Appendix b
Intervention (information on FiT and NEM)