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Analyzing the Constructs of Stakeholder Engagement towards Renewable Energy Projects Success in Malaysia: A PLS Approach

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Abstract

Stakeholder engagement is increasingly becoming a part of practice in delivering successful project outcomes. However, there is a limitation of studies on how the stakeholder engagement approaches are being implemented primarily towards mega-scale projects such as renewable energy projects. This paper intends to fill the gap by analyzing the relationship between ten identified constructs of stakeholder engagement and renewable energy project success. Data was collected through survey questionnaires applied to the Renewable Energy Power Providers (REPPs) in Malaysia, using stratified random sampling. SPSS ver.23 and SmartPLS 3.0 was applied to test measurement and structural models of this study. The findings revealed that effective communication, continuous consultation, understand intention and behavior, implement plans, build good relationships, analyze changes, risk mitigation, compromise conflicts, understand project success and good project governance were significant critical constructs of stakeholder engagement that were confirmed as drivers that influenced the renewable energy project successfully. It is apparent that this study allows the contribution to the body of knowledge of project management and offers some important insights into limited literature on stakeholder engagement. This study also shed light on the key stakeholders' groups in developing successful renewable energy projects.

Keywords: stakeholder engagement, renewable energy projects, project success, Malaysia

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1. Introduction

The renewable energy industry is growing at a rapid pace around the world. The Renewable 2018 Global Status Report in REN21 (2018) claimed that the renewable energy industry had achieved its largest annual increase ever in 2017, which accounted for 70% of net additions to global power generating capacity. Besides, developing countries such as China, Europe, and the United States were consistently leading in the renewable energy industry and committed $177 billion or accounted for nearly 75% of the global

investment (Frankfurt School-UNEP Centre/BNEF, 2018). Increasing developments in this industry have led Malaysian government to recognize renewable energy as the fifth fuel equivalent with gas, oil, hydro-electric and coal for grid-connected electricity generation under the Eighth Malaysia Plan (8 MP) in 2001. Since then, the government has taken various efforts to uptake and boost up the generation of renewable energy in the overall fuel mix. These were through the implementation of initiatives such as the Small Renewable Energy Programme (SREP), Malaysia Building-Integrated Photovoltaic Project, Feed-in-Tariff (FiT), Large-Scale Solar Photovoltaic (LSS-PV) and also Net Energy Metering (NEM) programme. Apart from that, the Energy Commission of Malaysia (2016) reported that more than 300 renewables energy licensees were awarded to commence the renewable energy projects. However, despite many initiatives taken by the government, the transition and development of renewable energy projects in Malaysia are not without a drawback. Prior research has emphasized the major issue in implementing renewable energy projects is managing stakeholder relationships. Since the use of renewable energy plays an important role in achieving the sustainable development, there is uncertainty on how every project are perceived by the different stakeholders involved (Nie, Chen, Yang, & Wang, 2016; Wehn, Collins, Anema, Basco-Carrera, & Lerebours, 2018). A wide range of stakeholders with diverse backgrounds and interests may intricate relationships and interactions in renewable energy projects. Baudry, Delrue, Legrand, Pruvost, & Vallée, (2017) asserts that every mega-scale project is often 'human-driven' and since renewable energy projects considered as national agenda initiatives, stakeholders are the essential figures and critical factors to deliver a project successfully. Besides, the high complexity of project stakeholders has been a barrier in establishing stakeholder mutual understanding and collaborations which lead to many challenges and drawbacks of deployment the renewable energy projects. Consequently, stakeholder engagement is considered as a success factor for the implementation of renewable energy projects.

Currently, effective stakeholder engagement is undoubtedly becoming a part of professional practice in order to deliver project outcomes positively. Extensive literature has been carried out concerning stakeholder engagement and relationships in other fields especially in manufacturing and construction, but very few studies have been conducted in renewable energy (Baudry et al., 2017; Bourne, 2015; Cuppen, Bosch-Rekveldt, Pikaar, & Mehos, 2016; Kahla, 2017; Mojtahedi & Oo, 2017; Mok, Shen, & Yang, 2015; Xu et al., 2018). In the context of Malaysia, Sawandi, (2014) mentioned that the application of stakeholder engagement is not new, however to date, there has been little empirical work on the means of organizations engage with stakeholders and it was only limited on

specific sectors such as in the financial and business sector. Therefore, the limitation of literature and the gaps in the implementation of stakeholder engagement, specifically in Malaysia renewable energy projects set the basis of this study. Apart from that, there is still lack of a validated and reliable framework for stakeholder engagement as a guide to increase the performance of renewable energy projects (Sovacool, 2013). This paper intends to fill the gap by identifying critical constructs of stakeholder engagement in the context of projects and analyzing the relationship between identified critical constructs of stakeholder engagement and renewable energy project success. The conceptual framework has been constructed from previous literature and, thus, has been tested in the renewable energy sector. The outcome of this study will be benefited for the key stakeholders' groups involved in the renewable energy sector in generating a framework that can deliver successful implementation of renewable energy projects. Apart from that, using Malaysia as a sample, this study offers some critical insights into stakeholder engagement among scholars worldwide and extend the limited literature on the critical constructs of stakeholder engagement that influence the renewable energy project success. The research objective of this study is to investigate the relationship between the constructs of stakeholder engagement and renewable energy projects success. The rest of the paper is structured as follows: Section 2 reviews the existence of empirical literature provides that helps develop the conceptual research framework and sets out the hypotheses of this study. Section 3, the research methodology, is described. Section 4 represents the data analysis and the respective results. Finally, the results are discussed, and conclusions are presented in Section 5.

2. Literature Review and Hypothesis

This study investigates the relationship between the determinants of stakeholder engagement and renewable energy project success in Malaysia. A review of related literature was undertaken with the primary focus on the stakeholder engagement approaches and renewable energy project success as well as the theoretical relationships between them. The stakeholder theory introduced by Freeman (1984) was used in this study to explain the extent of stakeholder engagement factors to leverage the success of one's organization. Freeman (1984) in his book further explained, within a project management discipline, the stakeholder theory recommends project managers to stay in constant touch with their stakeholders through stakeholder engagement framework so that project could avoid failure (Agyapong, 2017). A study by Eskerod, Huemann, & Ringhofer (2015) also emphasized that the stakeholder theory has recognized

the continual engagement between stakeholders as being an essential component of the organization' success story. Therefore, this stakeholder theory was used as the foundation of this study in achieving the renewable energy project successfully through the stakeholder engagement activities. Figure 1 below illustrates the proposed conceptual framework of this study. The framework was developed based on the ten measurement or indicators items of stakeholder engagement which are effective communication, continuous consultation, understand intention and behavior, implement plans, build good relationships, analyze changes, risk mitigation, compromise conflicts, understand project success and good project governance. It proposes that stakeholder engagement activities implemented by the renewable energy project developer or service providers will achieve the development and deployment of a successful renewable energy project in Malaysia.

2.1. Effective Communication

Effective communication is described as an important approach between project managers and all stakeholders either directly or indirectly involved in the project. Zhou, Cheung, & Hsu (2017) has emphasized that effective communication is required in ensuring adequate information is well transfer between project managers with relevant stakeholders internally or externally. Similarly, Takim (2009) highlights that effective communication channels are essential, so that information transfer between project teams are well circulated. However, it had been argued in ensuring the intended information is understood and the desired response is achieved, a clear communication requires relentless and also time-consuming effort especially in the complex projects such as renewable energy projects (Sadhukhan et al., 2018; Chan & Oppong, 2017; Oppong, Chan, & Dansoh, 2017; Mok et al., 2015). Bakens, Foliente, & Jasuja, (2005) pointed out that the effective communication in stakeholder engagement is significant in delivering the concept of 'effective'; which are consist of delivering the right and precise information to the related stakeholders by using appropriates means of communication and clarifying the project objectives. Similarly, Heravi, Coffey, & Trigunarsyah, (2015) found that effective communication is playing a critical role in achieving project success by facilitating the provision of clear project objectives among stakeholders especially during the early stages of projects. Therefore, the following hypotheses are formulated:

H1: Effective communication is positively related to the renewable energy project success

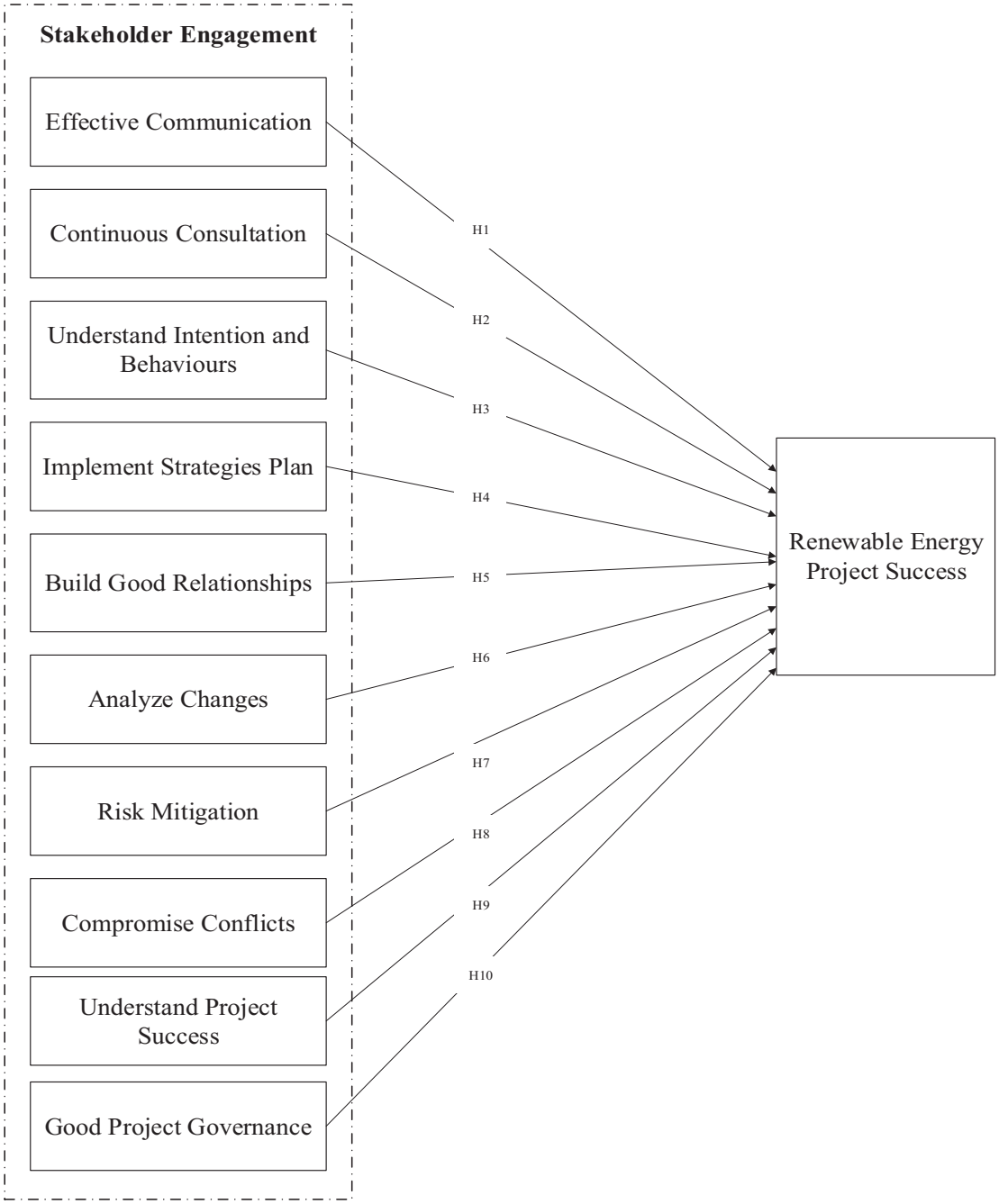

Figure 1: Conceptual Framework.

2.2. Continuous Consultation

Continuous consultation is an effective method for gaining project stakeholder's support. A continuous consultation is an act of asking relevant people for their advice and how they feel in order to get useful information and ideas (El-Sawalhi & Hammad, 2015; Senaratne & Ruwanpura, 2016; Tang & Shen, 2013). Davidson, (2017) further explained that consultation session with stakeholders should always be ongoing

throughout the project life cycle. In her review, Davidson, (2017a) emphasized that continuous consultation between the project team and other stakeholders will provide a clear and consistent stakeholder analysis, and therefore, will also contributing to the successful delivering of project. Unlike Davidson, (2017a), A. Heravi et al., (2015) argues that even though consulting with stakeholders and obtaining their feedback is necessary during the stakeholder engagement process, it does not mean that all of their needs and issues will necessarily be fulfilled. However, Bal, Bryde, Fearon, & Ochieng, (2013) argues that there is a need to continuous consultation whether all stakeholders are meeting their essential needs and responsibilities because it implies that their views can be considered during the crucial planning processes and can contribute to achieving a better outcome for the project. In the context of renewable energy projects, continuous consultation is a mechanism for deliberating the financial and funding issue between the project developer and financial institution (Upham, Shackley, & Waterman, 2007; Upham & Speakman, 2007; Xavier, Komendantova, Jarbandhan, & Nel, 2017). Therefore, the following hypotheses are formulated:

H2: Continuous consultation is positively related to the renewable energy project success

2.3. Understand Intention and Behaviors

Understanding the intentions and behaviors among different types of stakeholders involved in the project is very significant approaches. Bourne (2015); (2017) has highlighted in order to determine how project stakeholders wish to be engaged, and project managers should take consideration to understand the underlying motives and intentions of different stakeholders involved. Since many stakeholders are likely to have personal agendas that might help against what should be prioritizing. Bourne (2015) holds the view that “when encountering a stakeholder who appears to be unreasonable, their behavior often becomes more understandable when their ‘real’ agenda is discovered”. Similarly, previous literatures have emphasized that it is crucial to determine of what is the stakeholder’s ‘real’ intention during engagement process so that project manager can be more strategically integrates and incorporates the views of stakeholders about the practical approaches which can maximize the effectiveness of their involvement and help to achieve project success in implementing renewable energy initiatives (Jing, 2010; Yang, Shen, Ho, Drew, & Chan, 2009; Karlsen, Græe, & Jensvold Massaoud, 2008). Therefore, the following hypotheses are formulated:

H3: Understand the intention and behaviours is positively related to the renewable energy project success

2.4. Implement Strategies Plan

Practically in many projects, the strategic plans for stakeholder engagement approaches do not exist in any form. The plans are usually being set as the intuitive approach in the heads of the project leaders (Sheriff, 2012). In consequence, stakeholder engagement approaches cannot be implemented accordingly and may affect the performance of the project. Jing, (2010); Mok, Shen, Yang, et al., (2017) further mentioned that in ensuring the project moving forward, the project managers should implement the planned strategies accordingly. Therefore, instead of a 'make it up as we go along' approach, the stakeholder engagement approaches needs to be planned and should be deliberately and wisely resourced (El-Sawalhi & Hammad, 2015; A. H. Heravi, 2014). Towards the successful implementation of sustainable energy initiative, especially in developing renewable energy projects, each organization should have strong stakeholder engagement plan (Dusyk, 2013; Lee & Leal, 2014). Therefore, the following hypotheses are developed:

H4: Implement strategies plan is positively related to the renewable energy project success

2.5. Build Good Relationships

In achieving a successful project and fulfill the stakeholder expectations, building and sustaining a good relationship among stakeholders is very important strategies. Bal et al., (2013); Molwus (2014) further emphasized that building good relationships between project stakeholders will create positive project outcomes. It is very important that managers have a good relationship with key stakeholders since it is crucial in ensuring that stakeholders stick into the engagement process. However, A. H. Heravi (2014) argues that it is sometimes difficult to maintain good relationships, especially with external stakeholders. About the renewable energy sector which still new in developing countries as Malaysia, there is a need for project teams to be as transparent as possible and enhance a mutual relationship with other project stakeholders (Joshi, 2018). The extant literature stresses that keeping and promoting positive relationships is success factors for engaging the stakeholders and how it remains critical in ensuring project success. Thus, the following hypothesis is developed:

H5: Build good relationships is positively related to the renewable energy project success

2.6. Analyzing Changes

Changes are unavoidable during the project's life cycle. Extant research has indicated that analyzing the changes in the stakeholder environment, for example, the information, influence, relationships, and behaviors, are necessary (Aaltonen & Kujala, 2016; Aaltonen & Sivonen, 2009; Cabrera-Nguyen, 2010; D. H. T. Walker, Bourne, & Rowlinson, 2008). Mok et al., (2015) emphasized that to avoid any project planned issues, there is needs to reveal any changes in the stakeholder management processes, methods, and activities so that necessary adjustments can be made in the planning phase (Lehtinen, Aaltonen, & Rajala, 2018). One such method is providing high technology-applied solutions which benefit the project teams to analyze changes. However, Sherriff, (2012) mentioned that if the project teams failed to adopt advanced technology into managing changes, the project success could not happen. Therefore, properly managing and analyzing changes will boost the stakeholder engagement process and achieving project success. Based on the literature discussed above, the following hypotheses have been formulated:

H6: Analysing changes is positively related to the renewable energy project success

2.7. Risk Mitigation

Risk mitigation describes as the mechanism of stakeholder engagement. Mojtahedi & Oo (2017) describes risk mitigation as the solution to how well stakeholders can be managed and engaged. The function of risk mitigation is important to evaluate and incorporate environmental, political, social, and reputational risks triggered by stakeholder engagement (Molwus, 2014b; Sherriff, 2012). Apart from that, Toor & Ogunlana (2010) highlights that stakeholder engagement is an important element of risk management since stakeholder's behavior and attitude are always regarded as project risks. By understanding and potential restraining uncertainty, related risks triggered by project stakeholders, especially during the pre-execution phase will help project teams mitigating the risks (Bal et al., 2013). Pertaining to this study, renewable energy is considered as the national to agenda and identified as high-risk project which potentially interject the successful implementation of project. Therefore, risk mitigation is essential approach during the stakeholder engagement process in early planning

phase of project. Based on the literature discussed above, the hypothesis below is developed:

H7: Risk mitigation is positively related to the renewable energy project success

2.8. Compromise Conflicts

Conflicts are a major cause of disputes and litigations in projects (Senaratne & Ruwanpura, 2016). Aaltonen (2011) highlighted that conflicts or resistance from the public can poorly affect the project since the public is part of an external stakeholder who always lacks any formal project authority. Similarly, El-Sawalhi & Hammad, (2015) as well as A. H. Heravi (2014) emphasized that identifying and analyzing possible conflicts and coalitions among stakeholders during the pre-execution phase is a critical approach. Compromising conflicts of interest and objectives through appropriate legal resolution is indicative of stakeholder engagement performance and can lead to project success. Therefore, the hypothesis below is developed:

H8: Compromising conflicts is positively related to the renewable energy project success

2.9. Understand Project Success

Generally, the criteria of project success are often measured by considering the final cost, time, and quality outcomes which known also as triple project constraint. However, Davis, (2014) and Bourne (2017) mentioned that project success can be measured by examining the project stakeholders' value that contributed to the organizations that invested in it. Yu et al. (2017) mentioned that the value of the project stakeholders should be continuously evaluating stakeholder's satisfaction. Such evaluations will present the progress performance of the project and effectively inform the project teams. Besides, the literature confirmed that by understanding project success, project teams could assess the degrees of key stakeholder group's specialties and evaluate the stakeholders' expectation in delivering project success. Therefore, the hypothesis below is formulated:

H9: Understand project success is positively related to the renewable energy project success

2.10. Good Project Governance

Good project governance is currently seen as the main key in any project management. In the previous study by J. Yang (2014) showed that good project governance provides clarity of responsibility, accountability, lines of communication, and decisions making among project stakeholders involved. Additionally, organizations that fulfill the corporate social responsibilities (CSR) programmes which include values of economic, legal, environmental, ethical and cultural is very crucial in engaging project stakeholders (Aragonés-Beltrán, García-Melón, & Montesinos-Valera, 2017; J. Yu & Leung, 2015).About this study, good project governance is a crucial approach during the stakeholder engagement process especially during the pre-execution phase of renewable energy projects. Therefore, based on the literature discussed above, the hypothesis below is developed:

H10: Good project governance is positively related to the renewable energy project success

3. Methodology

This study has been operationalized using three phases, which were a literature review, data collection and lastly, data analysis. The first phase is the literature reviews. In this phase, the identification of the main research problems is discovered, and relevant secondary data were analyzed to develop research objectives and initial survey questions. The systematic literature reviews on the secondary data help to develop a framework for the intended research. Next, the survey questionnaire was utilized for data collection purposes. In this phase, survey instruments were established based on the literature reviews and sampling method with an appropriate sample size was decided. The last phase is data analysis. All data collected are classified and analyzed by using both SPSS ver.23 and SmartPLS 3.0 software.

3.1. Population and Sampling Technique

There were 390 of a total population of all service providers known explicitly as Renewable Energy Power Producers (REPPs), mainly located in Peninsular Malaysia, Sabah and Sarawak. REPPs were selected as targeted respondents due to multi-disciplinary roles as project providers, energy service providers, technology providers, project consultant, and acts as the main contractor for interconnections. The unit analysis is the individuals

of organization member in REPPs specifically from the groups of the management level who have directly or indirectly involved in the decision making process and have professional experience in managing the renewable energy projects. In selecting the respondents, stratified random sampling was adopted, and a list of respondents was provided by Energy Commissioning and Sarawak Energy official website. By using G*Power software version 3.1, 118 samples size was used in this study.

3.2. Research Instrument

Quantitative research methodology approach was adopted in this study. Therefore, the survey questionnaire was employed for data collection to indicate the influence of stakeholder engagement critical construct towards the renewable energy project success. The survey questionnaire contained 30 measurement items for stakeholder engagement variables, grouped into ten critical constructs. Table 1 shows the details of the measurement of constructs used in this study were adapted from previous studies. Besides, the range of response on Likert scale was used from the lowest to the highest as 1 = Not Important; 2 = Slightly Important; 3 = Moderately Important; 4 = Important; 5 = Very Important.

Table 1: Measurement of Constructs.

Types of Variable	Construct	Measurement Items	Sources
Independent Variable (IV)	Stakeholder Engagement	Effective communication	Heravi (2014)
		Continuous consultation	Heravi (2014); Sheriff (2012)
		Understand the intentions and behaviors	Molwus (2014); Heravi (2014)
		Implement strategies plan	El-Gohary, Osman, & El-Diraby (2006)
		Build good relationships	Molwus (2014); Heravi (2014)
		Analyze changes	Sheriff (2012)
		Risk mitigation	Sheriff (2012)
		Compromise conflicts	Hammad (2013); Sheriff (2012);
		Understand project success	Heravi (2014); Hammad (2013)
		Good project governance	Heravi (2014); Hammad (2013)
Dependent Variable (DV	RE Project Success		Maqbool & Sudong, (2018)

3.3. Data Collection and Analysis

Pre-test and pilot test were conducted in March 2019 for the purposed of content validation of the measurement items. The pre-testing was conducted with the industry experts, particularly in the Malaysia renewable energy sector. Notably, three respondents were selected based on a convenience sampling technique, and face-to-face interviews were used to get fast and clear feedback from the respondents. Pilot testing was carried out with an actual group of respondents which are REPPs. The results of the pilot test provide an overall satisfactory depiction of the survey questionnaires. Then, the Cronbach's alpha coefficient was used for reliability analysis and revealed that all items have higher reliability values of $p > 0.70$, which is 0.937. This is consistent with the previous studies. Majority of the participants found the survey questions clear and easy to respond. Nevertheless, few changes are required in some of the questions, and after modifications, the survey questions were finalized. After all, data were collected, firstly using SPSS Version 23 software that was used to analyse the descriptive statistics. Secondly, the SmartPLS 3.0 software was used for testing the goodness of the model and hypothesis testing.

4. Results

Out of the 200 distributed questionnaires, 74 questionnaires were returned and used for statistical analysis, indicating a response rate of 37%. A filter question was applied in the questionnaires which targeted the organizations of Renewable Energy Power Providers (REPPs) that were practicing stakeholder engagement. There were few reasons existed for non-response. These were due that some organization's policy was confidential and resisted to share information with outsiders and also due to the person in charge was not being interested in participating in the survey questionnaires. Before assessing the measurement model, the common method bias (CMB) is detected through a full Collinearity assessment approach (Kock, 2015). The indicative that the model is free from CMB is when the VIF values should be lower than the 3.3 threshold (Hair et al., 2017, Kock, 2015). Any value greater than 3.3 means the model is affected by CMB. Table 2 shows the demographic information of the respondents. The number of male respondents was higher than female respondents, with 45 male respondents (67.6%) and 28 female respondents (41.79%). Most of the respondents held a degree or professional qualification (47 or 64.38%), followed by a diploma (14 or 19.18%), postgraduate (12 or 16.44%), and high school or below (16 or 8.9%). In terms of years of experience in the

renewable energy sector, 47 (64.38%) of them have less than five years. Meanwhile, 25 respondents have 11 to 15 years of work experience (34.25%) and other 5 respondents have 16 to 20 years of experience (6.85%). Most of the respondents of the survey were the project manager (42 or 57.53%), followed by a senior manager (18 or 24.66%), CEO/Director of the organization (9 or 12.33%) and lastly, supervisor (4 or 5.48%). With the regards of type of organizations, most of the respondents came from private operator companies (53 or 72.60%). Secondly from public utility companies (12 or 16, 44%) and from both public-private partnership and associations (4 or 5.48%). Lastly, in regards to the area of renewable energy specialization, most of the organization were into solar photovoltaic (PV) sources with 37 numbers (50.68%), biomass with 19 numbers (26.03%), next is biogas sources with 11 number (15.07%) and mini-hydro with 6 number of organizations (8.22%).

Table 2: Demographic Profile of Respondents.

		Respondents (N = 73)	
Demographic variables	**Category**	**Frequency**	**Percentage (%)**
Gender	Male	45	67.16%
	Female	28	41.79%
Academic qualification	High school or below	0	0.00%
	Diploma	14	19.18%
	Degree or professional qualification	47	64.38%
	Postgraduate	12	16.44%
Years of experience	<5 years	43	58.90%
	6 – 10 years	25	34.25%
	11 - 15 years	5	6.85%
	16–20 years	0	0.00%
	>20 years		0.00%
Job position	CEO/Director	9	12.33%
	Senior Manager	18	24.66%
	Project Manager	42	57.53%
	Supervisor	4	5.48%
Type of organization	Public utility	12	16.44%
	Private operator	53	72.60%
	Public-private partnerships	4	5.48%
	Associations	4	5.48%
Area of specialization	Biomass	19	26.03%
	Biogas	11	15.07%
	Mini-Hydro	6	8.22%
	Solar Photovoltaic	37	50.68%

4.1. Assessment of Measurement Models

In this study, the confirmatory factor analysis (CFA) was conducted to test the reliability, convergent validity, and discriminant validity of the measures. For assessing the convergent validity Hair, Babin, & Krey, (2017) has suggested using of factor loadings, Average Variance Extracted (AVE), and Composite Reliability (CR). To be considered acceptable, the items of factor loadings have to close to or more significant value of 0.50 (Hair Jr., Matthews, Matthews, & Sarstedt, 2017). Besides, all AVE must exceed the value of 0.50, and the CR for the items must exceed value 0.70 (Hair, Hollingsworth, Randolph, & Chong, 2017; Bagozzi, Yi, & Phillips, 1991). As indicated in Table 3, the results of the measurement model show that the constructs were valid since the loadings, CR, and AVE values surpassed the cut-off value a. However, it were exception for CC3, ISP1 and SUCC4 which their factor loadings were below 0.5 and therefore, were removed from the construct's structure.

In addition, this study used the Heterotrait-Monotrait Ratio to test for discriminant validity which was illustrated in Table 4. A value of or less than 0.85 for HTMT should be confirmed. Henseler, Ringle, Rold´an, & Cepeda, (2015) suggested a threshold value of 0.90 if constructs are conceptually very similar and.85 if the constructs are conceptually more distinct.Referring to Table 4, it can be deduced that the HTMT criterion is met,thus indicating that the discriminant validity is established. Overall, the measurement model of this study was considered acceptable with the evidence of satisfactory reliability, convergent validity, and discriminant validity.

4.2. Assessment of Structural Models

Table 5 shows the results of testing the structural models. The results revealed that ten hypotheses were supported and significantly related to renewable energy project success. This study utilized the R-squared (R2) of regression analysis to determine how well the data collected fit with the regression model. The relationship between stakeholder engagements critical constructs and renewable energy project success was analyzed. In this study, t-value > 1.65 which was equivalent of a 1 tailed was used as the cut-off of acceptance level. The hypothesis was rejected if the t-value was lower than 1.65. Based on the results shows in Table 5, H1, H2, H3, H4, H5, H6, H7, H8, H9, and H10 were positively supported. The finding indicates that effective communication, understand intentions and behaviors, implement strategies plan, build good relationships, analyze changes, risks mitigation, and good project governance

Table 3: Results of Measurement Model.

Items	Constructs	Outer Loadings	Composite Reliability (CR)	Average Variance Extracted (AVE)
Effective Communication (EC)	EC1	0.857	0.829	0.619
	EC2	0.769		
	EC3	0.730		
Continuous Consultation (CC)	CC1	0.920	0.848	0.737
	CC2	0.792		
	CC3	Item deleted		
Understand the Underlying Intention and Behaviours (UIB)	UIB1	0.738	0.824	0.611
	UIB2	0.719		
	UIB3	0.878		
Implement Strategies Plan (ISP)	ISP1	Item deleted	0.854	0.745
	ISP2	0.809		
	ISP3	0.914		
Building and Sustaining Good Relationships (BSR)	BSR1	0.707	0.807	0.583
	BSR2	0.833		
	BSR3	0.746		
Analysing the Changes(AC)	AC1	0.813	0.860	0.672
	AC2	0.812		
	AC3	0.834		
Risk Mitigation (RM)	RM1	0.826	0.766	0.527
	RM2	0.568		
	RM3	0.758		
Compromising Conflicts (CO)	CO1	0.730	0.838	0.633
	CO2	0.842		
	CO3	0.811		
Understand Project Success (UPS)	UPS1	0.872	0.824	0.611
	UPS2	0.858		
	UPS3	0.854		
Good Project Governance (GPG)	GPG1	0.846	0.830	0.621
	GPG2	0.829		
	GPG3	0.678		
RE Project Success (SUCC)	SUCC1	0.859	0.869	0.689
	SUCC2	0.870		
	SUCC3	0.756		
	SUCC4	Item deleted		

were most significant stakeholder engagement constructs. These critical constructs

Table 4: Discriminant Validity: Heterotrait-Monotrait ratio (HTMT) Results.

	AC	BSR	CO	CC	EC	GPG	ISP	REPS	RM	UIB	UPS
Analyzing Changes											
Building & Sustaining Relationship	0.843										
Compromise Conflict	0.758	0.408									
Continuous Consultation	0.387	0.525	0.477								
Effective Communication	0.670	0.669	0.622	0.841							
Good Project Governance	0.771	0.744	0.811	0.464	0.725						
Implement Strategic Plan	0.702	0.830	0.744	0.810	0.570	0.754					
RE Project Success	0.726	0.818	0.666	0.359	0.597	0.662	0.550				
Risk Mitigation	0.710	0.838	0.775	0.782	0.673	0.634	0.686	0.657			
Understand Intention & Behaviour	0.554	0.848	0.823	0.680	0.680	0.709	0.796	0.420	0.754		
Understand Project Success	0.743	0.751	0.779	0.552	0.672	0.690	0.724	0.642	0.735	0.645	

also were confirmed as drivers that positively contribute to the successful development of renewable energy projects.

Table 5: Summary of Hypotheses Testing of PLS Path Model.

Hypotheses	Path	Path Coefficient	Standard Deviation	t-value (1 tailed)	Supported
H1	EC → REPS	0.187	0.376	2.310	Yes
H2	CC → REPS	0.036	0.070	2.507	Yes
H3	UIB → REPS	-0.178	0.084	2.121	Yes
H4	ISP → REPS	-0.246	0.116	2.112	Yes
H5	BSR → REPS	0.284	0.740	1.830	Yes
H6	AC → REPS	0.137	0.159	1.865	Yes
H7	RM → REPS	0.470	0.179	2.624	Yes
H8	CO → REPS	0.136	0.070	1.707	Yes
H9	UPS → REPS	-0.211	0.156	1.654	Yes
H10	GPG → REPS	0.556	0.136	4.086	Yes

5. Discussion

In order to provide insight and investigate the influence of the stakeholder engagement for delivering successful renewable energy projects in Malaysia, this study was conducted to examine the relationship between the critical constructs of stakeholder engagement and renewable energy project success. In general, the findings presented that all ten hypothesized were statistically supported. The analysis of direct effects

showed that the effective communication, continuous consultation, understand intention and behaviors, implement strategies plan, build good relationships, analyzing changes, risk mitigation, compromise conflict, understand project success and good project governance have a positive direct relationship with renewable energy projects success.

Consistent with previous findings, the development and deployment of renewable energy projects can be successfully implemented if project managers emphasize effective communication among all key stakeholder involved (Heravi, Coffey, & Trigunarsyah, 2015). Apart from that, the importance of effective communication among stakeholders will help the project managers to identify and salient the stakeholder's groups. Heravi et al., (2015) mentioned that it was found that if relevant stakeholder groups are systematically identified then the owners and decision-makers can efficiently interact with them and decide upon the significance and the importance of each group. Bal (2014) reinforced this view and stated that a proper identification process is an important step to distinguish between the parties to be involved and the parties not be involved. If the project members are clearly identified, then it will be easier for the leaders to involve and communicate with them.

The analysis also shows that continuous consultation has a positive impact on a renewable energy project. Since the renewable energy projects are known as national agenda, there may be situations where diverse expectations and various interpretations of project requirements create a controversial situation, which brings of confusion and conflicts of what stakeholder primarily want. An essential step to overcoming this issue is to continuously consult the relevant stakeholders by getting their needs, requirements, and expectations. Aaltonen & Kujala, (2016) and Lehtinen et al., (2018) stated that by collecting needs and preferences from project stakeholders, conflicts to plans and other issues that sometimes happen in the execution and operation phase will be minimized. This is also can be implemented when strategizing the stakeholder engagement plan. Since it is proven in the analysis, the stakeholder engagement plan is directly contributed to the project success, especially in renewable energy projects.

The results also shown that building good relationships within project stakeholders has a significant contribution to project success. Based on the previous literature, public perceptions conveys important aspects in developing and deployment of renewable energy initiatives. Previous research has strongly focused on the internal stakeholders while little has been given attention to the effect on the legitimate 'secondary stakeholders,' which is the public. (Mojtahedi & Oo, 2017; Jami & Walsh, 2014; Richard & David, 2018; Di Maddaloni & Davis, 2017). In the context of renewable energy initiatives, Pagnussatt, Petrini, Santos, & Silveira (2018) in their research found that by building and

sustaining a good relationship with the public will bring significant value to the initiated renewable energy projects in terms of economy, social and environment.

Apart from that, the results also agreed that analyzing changes and mitigation of risk are essential in determining the renewable energy project success. This results consistent with the extant literature that emphasized the needs of these approaches during the early stages of projects were crucial (Molwus, 2014b; Sherriff, (2012). Similary, Cuppen, et al., (2016) elaborates that early action in managing risks and changes may result in the financial and technical benefits and achieved the project sustainability. Next, the findings also showed that compromising conflict has significantly impacted renewable energy project success. It is suggested that by providing alternative dispute resolutions such as facilitation, negotiation, mediation and arbitration will resolve a difference among stakeholders before and after it reaches the stage of a dispute (Heravi, 2014). Understand project success will result in the positive effect of renewable energy project success; which has been proven in the results while the development of renewable energy projects brings a wide variety of economic, environmental, and social benefits, the challenges in implementing these projects also inevitable. Therefore, based on the results, it is proven, good project governance is the proper mechanism for engaging all stakeholder involved.

Overall, the analysis of the data in this study also reveals that the respondents were aware of the significance of early engagement, but their understanding of the issues was constructed through experience, and not based on any framework, standards or other formal instruction/documentation. The stakeholder engagement activities presented in this study has grouped into ten components which represents the hypotheses of this study that is contributing the improvement stakeholder engagement; by applying more competent decision-making strategies in the initial and planning process phases of projects. Apart from that, these critical factors were frequently highlighted by the literature review and by the respondents as being important attributes for improving and removing the barriers of stakeholder engagement and accordingly impacted upon the successful implementation of renewable energy projects in Malaysia.

6. Conclusion and Implications

In summary, this study considers stakeholder engagement in the context of renewable energy projects in Malaysia; by providing insights into ten critical factors that influence stakeholder engagement towards renewable energy project success. The results obtained from this study as the empirical testing of the conceptual framework showed

significant positive direct effects between the independent and dependent constructs. Therefore, the hypothesized of this study show that effective communication, continuous consultation, understand intentions and behaviors, implement strategies plans, build good relationships, analyzing changes, risk mitigation, compromise conflict, understand project success and good project governance were positively significant towards the renewable energy project success.

From the discussion above, this study recognizes a few essential contributions to the theoretical and social perspectives. Firstly, it advanced the theoretical understanding of stakeholder theory by Freeman (1984) by empirically validating an amplified conceptual model consisting of ten critical factors of stakeholder engagement. Different from the previous literature, the stakeholder engagement was considered as stakeholders management attributes, and no critical success factors were determined. Associated with that, this study contributed to stakeholder engagement and management literature by providing a measurement model that may be replicated within the further research. Compared with past stakeholder management studies, that have only concentrated entirely on the stakeholder management process in a specific sector such as construction, manufacturing, and information system let alone systematic empirical investigations to test the relationship of critical stakeholder engagement approaches in the context of renewable energy sectors; which is currently trending worldwide. Therefore, the examination of this novel conceptual model may yield findings that contribute to the discussion on knowledge-based of stakeholder engagement within renewable energy initiatives.

Secondly, the findings of this study are very relevant in the present time by offering significant input for projects decision-making. The findings of this research produced valuable information to the project professionals in their pursuit of improving sustainability and achieved project success. Mainly, this study will give benefits or societal contribution, specifically to the stakeholders involved in renewable energy projects in Malaysia. The results of this study will generate greater awareness among key players in the renewable energy sector especially to the Renewable Energy Power Providers (REPPs) on the importance of having useful stakeholder engagement framework for successful development of renewable energy project in Malaysia. Lastly, this study is an attempt to highlights on the roles of stakeholder engagement in development and deployment of renewable energy projects and helping Malaysian government to achieve the target of renewables' proportion of generation mix to 20% by 2025 to 2030.

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