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Investigating the Stakeholder Engagement Indicators towards Renewable Energy Projects Success in Malaysia

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ABSTRACT

Stakeholder engagement has been acknowledged as being a vital approach in delivering successful project outcomes. However, there is a limitation of studies on how the stakeholder engagement can indicate the successful implementation of renewable energy projects. The purpose of this study is to fill the gap by investigating the influence of stakeholder engagement indicators towards renewable energy project success. This study suggests second-order model by extending stakeholder engagement indicators as hierarchical and integrating ten associated components. Data was collected through survey questionnaires applied to the Renewable Energy Power Providers (REPPs) in Malaysia, using stratified random sampling. SPSS ver.23 and Smart PLS 3.0 software was applied to test measurement and structural models of this study. The findings revealed that stakeholder relations, stakeholders' communication, stakeholders' learning and stakeholder integration were positively significant towards the renewable energy project success. It is apparent that this study allows contribution to the body of knowledge of project management and offers some important insights into limited literature on stakeholder engagement.This study also sheds light on the key stakeholders' groups in developing successful renewable energy projects.

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

Introduction

Meaningful stakeholder engagement has become a central requirement in order to achieve successful project outcomes. Meaningful stakeholder engagement brings long-term project benefits such as sustainability and resilience, also developing fragile but powerful intangible assets requirement such as trust, ownership, and acceptability (Wehn, Collins, Anema, Basco-Carrera, & Lerebours, 2018). In a similar fashion, Sachs & Rühli, (2011) and later on Bellucci & Manetti (2019) analyzed that the implementation of stakeholder engagement is essential to a company's efforts through better-informed decisions and good practice in creating value to stakeholders. Meanwhile, ineffective engagement can lead directly to negative impacts through failure fulfilling the needs and expectations of various stakeholders early and effectively before they escalate(Agyapong, 2017). Although the stakeholder literature emphasizes that stakeholder engagement is highly critical for project success(Lynda Bourne, 2017; Mojtahedi & Oo, 2017; Mok, Shen, & Yang, 2015), many companies still face significant challenges in getting it right. Therefore, there is need for a substantial framework about how to conduct stakeholder engagement in an effective way.

In a context of current social and environmental concerns such as climate change and transition of sustainable energy, the role of stakeholder engagement in delivering project agility has drawn increasing attention in recent years. There is a trend and emerging practice in stakeholder engagement and since projects experience a high

degree of change and require active engagement, the element of stakeholder engagement has been considered for agile environments (PMI, 2017). Apart from that, as the broader definitions of stakeholders are being developed, stakeholder engagement is a significant approach to cope with a wider stakeholder community and complexity of stakeholder relationship, particularly in renewable energy projects. The high complexity of project stakeholders has been a barrier in establishing mutual stakeholder understanding and collaborations which lead to many challenges of deployment of renewable energy projects (Baudry, Delrue, Legrand, Pruvost, & Vallée, 2017). Since renewable energy projects are considered as national agenda initiatives, stakeholders are essential drivers of agility and critical factors to deliver a project successfully. Thus, engaging project stakeholder accelerates results and is considered a key success factor for the implementation of renewable energy projects.

In Malaysia, renewable energy projects are growing at a rapid pace. Since 2001, the government under the supervision of Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) has taken various efforts to uptake and boost up the generation of renewable energy in the overall fuel mix. Energy Commission of Malaysia (2016) also reported that more than 300 renewable energy licenses were awarded to commence the renewable energy projects. However, despite many initiatives taken by the government, it is arguable that the development of renewable energy projects in Malaysia are under performaning. The statistical data shows there are significant gaps between current installed renewable energy capacity which is only 2% in 2018, compared to the government targets to achieve 20% in 2025 (MESTECC, 2019). Arguably, the data reflected that there are numerous barriers in implementing the renewable energy projects and most of the barriers are due to lack of integration among the renewable energy key players. Judging by the momentum of how the industry is going, it might take much longer for renewable energy projects to rise and taper the demand-supply gap in Malaysia, without simultaneous support coming from all project stakeholders (Hannan et al., 2018). Therefore, stakeholder engagement looks as a promising solution in ensuring the government target of renewable energy proportion is achieved.

Extensive literature has been carried out concerning stakeholder engagement in various fields, especially in manufacturing, business 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 et al., 2015; Xu et al., 2018). In Malaysia, Sawandi, (2014) mentioned that the application of stakeholder engagement is not new, however, there has been little empirical study on the means of company engagement with stakeholders. Meanwhile, there is still lack of a validated and reliable framework for stakeholder engagement from practice (Freeman, Kujala, & Sachs, 2017) particularly in complex projects such as renewable energy (Thomas et al., 2018). In short, the limitation of stakeholder engagement literature and the low performance of renewable energy projects in Malaysia set the research gaps of this study. Hence, the purpose of this study is to fill the gap by investigating the influence of stakeholder engagement indicators as a driver towards renewable energy project success.

This study will explore the indicators of stakeholder engagement in the context of projects and analyze the relationship between identified indicators of stakeholder engagement and renewable energy project success among renewable energy companies in Malaysia. This study addresses two main research questions: (1) What are the stakeholder engagement indicators in the context of projects? And (2), what is the relationship between identified stakeholder engagement indicators and renewable energy project success among key stakeholder groups in renewable energy market in Malaysia? To answer these questions, this study combines grounded and critical theoretical approaches with a quantitative research design allowing for a questionnaire survey process. This article is structured as follows: Section 2 presents key conceptual insights into the critical constructs of stakeholder engagement and the relationship between stakeholder engagement and renewable energy project success; and sets out the hypothesis of this study. Section 3 presents the research design and methodology of this study. In Section 4, the results of the data analysis are presented. Next, in Section 5, the results of the study are discussed. The article ends with a concluding section that includes the research implications in Section 6.

Literature Review

Theoretical Background

The stakeholder theory introduced by Freeman, Harrison, Hicks, Parmar, & Colle (2010)was used in this study to explain the extent of stakeholder engagement in leveraging the success of renewable energy projects. Freeman et al., (2010) has explained, since stakeholder theory has moved from the conventional management thinking in business ethics to a few management disciplines, there

is an increasing need to explore how businesses actually engage their stakeholders. Later, Freeman et al., (2017) further mentioned that stakeholder engagement is an important approach in practicing the idea of stakeholder theory. A study by Eskerod, Huemann, & Ringhofer (2015) emphasized that the stakeholder theory has recognized the continual engagement between stakeholders as being an essential component of the organization's success story. Likewise, within a project management discipline, the stakeholder theory recommends project managers to stay in constant touch with their stakeholders through the stakeholder engagement framework so that projects could avoid failure (Agyapong, 2017). Therefore, this stakeholder theory was used as the foundation of this study in order to help project managers learn how other companies choose to engage their stakeholders, to create as much value as possible, and lastly to achieve the development of renewable energy project successfully.

Stakeholder Engagement Indicators

Stakeholder engagement may be understood in a variety of different ways and from a variety of different scholars' perspectives. In this study, the term stakeholder engagement was adapted from (PMI, 2017). Considering the theoretical perspective, stakeholder engagement is defined as the process of meeting stakeholders' need or expectations in combating the issues, ensuring the stakeholder engagement activities are implemented throughout the project life cycle, and creating value to the stakeholders. Adapting a concept from the project-context will assist companies to have better example or good practice on how stakeholder engagement is implemented. Extant literature has determined various success factors in stakeholder engagement. Figure 1 illustrates the conceptual framework of this study, which is based on the literature reviews. Accordingly, this study has identified ten success factors of stakeholder engagement in literature and these factors were classified into four groups or indicators which are stakeholder relations, stakeholder communication, stakeholder learning, and stakeholder integration. These four indicators were dimensions of the stakeholder engagement framework adapted from (Freeman et al., 2017). Table 1 below shows the stakeholder engagement indicators and their attributes accessed in this study.

Stakeholder Relations (SR)

Recently, interest in stakeholder theory has moved from analyzing stakeholder attributes to examining the nature of stakeholder relationships. Global economy is a relational economy and in order to better understand the links between business, society and stakeholders, we need to comprehend what happens in stakeholder relations and how to create value with and for various stakeholders (Freeman et al., 2017). Previous scholars have determined few approaches in examining the stakeholders' relationships in complex environment. Firstly, understand the intentions and behaviors among different types of stakeholders involved in the project. Bourne (2015); (2017) has highlighted that in order to determine how project stakeholders wish to be engaged, 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 prioritized. Similarly, previous literatures have emphasized that it is crucial to determine what is the stakeholders' 'real' intention during the engagement process so that project managers can more strategically integrate and incorporate 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).

Table 1: Stakeholder engagement indicators and attributes assessed in thisstudy

Indicators	Attributes	References
Stakeholder Relations	Understand the intentions and behaviors	Molwus (2014); Heravi (2014)
	Build good relationships	Molwus (2014); Heravi (2014)
Stakeholder Communication	Effective communication	Heravi (2014)
	Continuous consultation	Heravi (2014); Sheriff (2012)
Stakeholders Learning	Implement strategies plan	El-Sawalhi &Hammad (2015)
	Analyze changes	Sheriff (2012)
	Risk mitigation	Sheriff (2012)
Stakeholder Integration	Compromise conflicts	El-Sawalhi &Hammad (2015); Sheriff (2012)
	Understand project success	El-Sawalhi &Hammad (2015); Heravi (2014)
	Good project governance	El-Sawalhi &Hammad (2015); Heravi (2014)

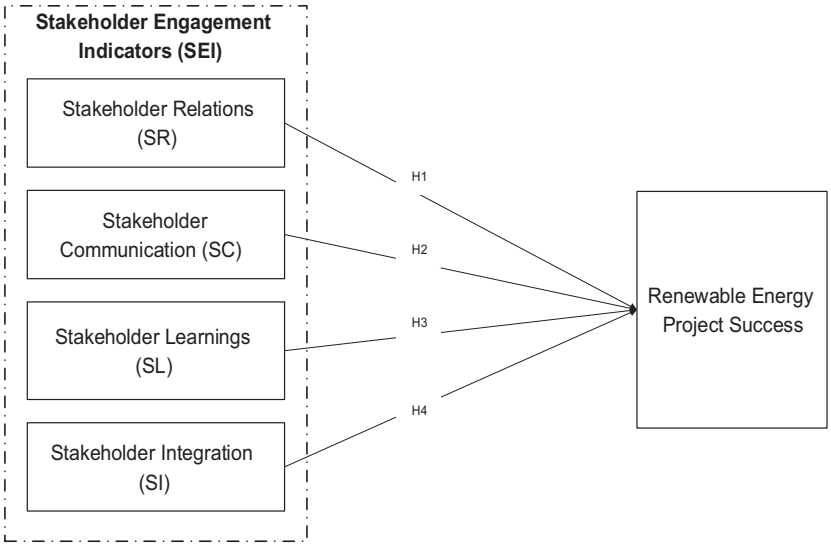

Figure 1: Conceptual framework

Secondly, in examining stakeholders' relationship, building and sustaining a good relationship among stakeholders is a very important strategy. Bal et al., (2013); Molwus (2014) further emphasized that building and sustaining good relationships between 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 to the engagement process. Arguably, it is sometimes difficult to maintain good relationships among various stakeholder groups, especially with external stakeholders (A. H. Heravi, 2014). Pertaining to this study, it is necessary to examine the complexity and the dynamic nature of stakeholder relationships in renewable energy projects in ensuring successful deployment and as a source of social value creation. Compared to other developing countries, the renewable energy sector is still new in Malaysia, therefore, companies involved need to have a strategic approach in engaging stakeholders and enhancing a mutual relationship among project stakeholders (Joshi, 2018). The extant literature stresses that examining dynamic and complex stakeholder relations as well as promoting positive relationships is a success factor for engaging the stakeholders and how it remains critical in ensuring project success. Thus, the following hypothesis is developed:

H1: Stakeholder relations positively affect renewable energy project success

Stakeholder Communication (SC)

Communicating with stakeholders is an important part of stakeholder engagement. There is plenty of previous literature on stakeholder communicationin renewable energy projects (Bukarica & Robić, 2013; Dhanesh, 2017; McKinley & Ballinger, 2018; Pillay, 2010; Zhang, Loh, Louie, Liu, & Lau, 2018). However, in achieving meaningful stakeholder engagement, effective communication-and continuous consultation are crucial approaches in communicating with stakeholders. 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) and Takim (2009) have emphasized that effective communication is required in ensuring adequate information is well transfered between project managers and relevant stakeholders internally or externally. However, it had been argued to make sure that the intended information is understood and the desired response is achieved, a clear communication requires relentless and also time-consuming effort especially in complex projects such as renewable energy projects (Sadhukhan et al., 2018; Chan & Oppong, 2017; Oppong, Chan, & Dansoh, 2017; Mok et al., 2015). Heravi, Coffey, & Trigunarsyah, (2015) pointed out that the effective communication in stakeholder engagement is significant in delivering the concept of 'effective'; which consists of delivering the right and precise information to the related stakeholders by using appropriate means of communication and clarifying the project objectives.

Meanwhile, continuous consultation is an effective method for gaining project stakeholders' 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

sessions 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 contribute to the successful delivering of the project. On the contrary, A. Heravi et al., (2015) explained 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. Bal, Bryde, Fearon, & Ochieng, (2013) argue 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). On the whole, considering the elements of communicating with stakeholders in achieving project success as mentioned above, the following hypotheses are formulated:

H2: Stakeholder communication positively affects renewable energy project success

Stakeholder Learning (SL)

Learning with and from stakeholders indicates the links of stakeholder theory in creating value of company. This approach suggests that the company that seeks internal and external information from the stakeholders will help to develop their routines and procedures further, and at the same time enhance their value creation opportunities. Stakeholders' learning can contribute to enlarge the body of knowledge that has incorporated into stakeholder research. A study by Anna Heikkinen in Freeman et al., (2017) emphasized that by learning from multi-stakeholders network it brings the usefulness of stakeholder engagement toaddress sustainability challenges. Likewise, Rühli, Sachs, Schmitt, & Schneider (2017) discussed and explored how companies and stakeholders learn from each other and can shed light on the wicked social issues and offering innovative solution. Again, pertaining to this study, by learning with and from stakeholders, the companies will be able to implement strategic plans for stakeholder engagement, analyzing changes, and mitigating risks. 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.The stakeholder engagement approaches need to be planned and should be deliberately and wisely resourced (El-Sawalhi & Hammad, 2015; A. H. Heravi, 2014); and towards the successful implementation of sustainable energy initiative, especially in developing renewable energy projects, each company should have a strong stakeholder engagement plan (Dusyk, 2013; Lee & Leal, 2014). Hence, it is important to have stakeholders'learning in order to get the best input and implement strategic stakeholder engagement plan towards the project.

Next, changes are unavoidable in the agile environment such as in the renewable energy projects. Extant research has indicated that analyzing 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). In cooperating the project agile, providing high technology-applied solutions will benefit the project teams to analyze changes. Sherriff, (2012)argued that if the project teams failed to learn and adopt advanced technology into managing and analyzing changes, the project could not succeed. In the same way, risk mitigation is described as the solution on how well stakeholders can be engaged (Mojtahedi & Oo (2017). By understanding and potentially restraining uncertainty, related risks triggered by project stakeholders, especially during the early project phase will help project teams mitigating the risks (Bal et al., 2013; Molwus, 2014a; Sherriff, 2012). Pertaining to this study, renewable energy is considered as the national agenda and identified as a high-risk project which potentially interjects the successful implementation of the project. Therefore, learning with and from stakeholders is an essential approach during the stakeholder engagement process in order to implement strategic plans, analyze changes, and mitigate potential risks in project. Based on the literature discussed above, the following hypothesis is developed:

H3: Stakeholders learning positively affects renewable energy project success

Stakeholder Integration (SI)

Extant literatures have different views on the integrative stakeholder engagement. The contributors in this part offer new conceptualizations and managerial practices based on in-depth studies of empirical cases (Freeman et al., 2017). Astudy by San-Jose, Retolaza, & Freeman, (2017) founds that there are significant implications on value creation for stakeholders in business such as cooperation, the power of relationships, and the

interconnections among stakeholders by reinforcing integrative stakeholder engagement. Apart from that, stakeholders' integration can be done if the stakeholders are able in compromising conflicts, understanding project success, and lastly, adapting good project governance. Firstly, conflicts are the cause of disputes and litigations in projects (Senaratne & Ruwanpura, 2016). Moreover, identifying and analyzing possible conflicts among stakeholders is a critical approach in complex project environment; hence, compromising conflicts of interest and objectives through appropriate legal resolution is indicative of stakeholders integration and can lead to project success. (El-Sawalhi & Hammad, 2015; A. H. Heravi, 2014).

Next, understanding project success will objectively integrate the stakeholder cooperation and later, creating value on stakeholders. Project success not only can be measured through considering the final cost, time, and quality outcomes but also by examining the project stakeholders' value that contributed to the organizations that invested in it (Davis,2014; Bourne, 2017). 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 groups'specialties and evaluate the stakeholders' expectation in delivering project success. Lastly, good project governance during the stakeholder engagement process is currently seen as the main key in any project management. Previous studies identified that good project governance provides clarity of responsibility, accountability, lines of communication, and decision-making among project stakeholders involved(Aragonés-Beltrán, García-Melón, & Montesinos-Valera, 2017; J. Yu & Leung, 2015; J. Yang, 2014). Therefore, based on the literature discussed above, the following hypothesis is developed:

> H4: Stakeholder integration positively affects renewable energy project success

Renewable Energy Projects Success Criteria

There is a distinction between project success factors and project success criteria. Project success factors identified the specific elements within the project, or the independent variables that enhance the success of the project; meanwhile, project success criteria are the measures by which the final outcome of the project will be judged as either being successful, challenged, or a failure (Müller & Jugdev, 2012). Among the intangible nature of the project outcomes, certain researchers have recommended, and developed certain approaches and tools for classifying project outcomes (Rajablu, Marthandan, & Yusoff, 2014). Generally, as indicated in PMI (2017) a successful project as one that is on time, under budget, and on target with scope – thereby fitting the 'triple constraints' model. Using the triple constraint model, most project managers describe their project as being successful when it is completed on time, is under budget, and satisfies all the requirements within the scope (De Schepper, Dooms, & Haezendonck, 2014). (De Schepper et al., 2014) further explained that since the project is owned or impacted by different stakeholders, the success definition for the project will also be different,which then makes it quite challenging to easily obtain a success criterion for projects. Since stakeholder engagement has been found to be a critical component of the project success, it is practical for a project manager to identify the project's overall acceptance criteria before it begins (Agyapong, 2017).

In the context of renewable energy projects, the project success criteria are determined if the project objectives are achieved and the successful projects may lead to effective renewable resources distribution. This statement is supported by Maqbool & Sudong, (2018) where emphasized that there is a gap in literature in identifying the significant success factors and criteria that create successful renewable energy projects. Therefore, pertaining to this study the successful renewable energy project is the combination of fulfilling the scope, within the budgeted cost, on scheduled time frame, on desired quality, and lastly, to the stakeholders' satisfaction.

Methodology

This cross-sectional study applied a quantitative design and the measurements for each indicator were adapted and adopted from several recent works of literature on stakeholder management and renewable energy projects as depicted in Table 1. Data were collected by using a set of the close-ended questionnaire survey to indicate the influence of stakeholder engagement indicators towards the renewable energy project success. The survey questionnaires were primarily based on the Likert Scale of five ordinal measures from one to five according to the level of importance. The questionnaire comprised of three sections and assessed the respondents' background, the stakeholder engagement indicators (adapted from ; El-Sawalhi & Hammad, 2015; A. H. Heravi, 2014; Molwus, 2014a; Sherriff, 2012) and the attributes of success

criteria for renewable energy projects (adopted from (Maqbool & Sudong, 2018).

Pre-test and pilot test of the questionnaires were conducted in March 2019 for the purposes of content validity, reliability, and brevity. Face-to-face interviews were used to get fast and clear feedback from the respondents during the pre-testing phase, and six respondents were selected which came from academicians and practitioners well-versed in stakeholder engagement and renewable energy projects. Pilot testing was carried out with an actual group of respondents from renewable energy sector, notably called Renewable Energy Power Providers (REPPs). REPPs is the key stakeholders'group in renewable energy projects due to multi-disciplinary roles as project providers, energy service providers, technology providers, project consultant, and acts as the main contractor for interconnections. All data were collected, firstly using SPSS Version 23 software that was used to analyze the descriptive statistics. Secondly, the SmartPLS 3.0 software was used for testing the goodness of the model and hypothesis testing. The results of the pilot test provide an overall satisfactory depiction of the questionnaires. Majority of the participants found the survey questions clear and easy to respond. Nevertheless, few changes were required in some of the questions, and after modifications, the survey questions were finalized.

Sample and Data Collection

There were 390 of a total populationof Renewable Energy Power Producers (REPPs) which were mainly located in Peninsular Malaysia.The unit analysis is the organization in REPPs specifically from the groups of the management level who have been 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 on the strata of decision making in companies (Fernando & Wah, 2017). List of respondents was provided in Energy Commissioning and Sarawak Energy official website. By using G*Power software version 3.1, 118 samples size was used in this study. Out of the 200 distributed questionnaires, 74 questionnaires were returned indicating a response rate of 37%. There were few reasons that existed for non-response which were due to the fact that some organization's policy was confidential and resisted to share information with outsiders and due to the person in charge not being interested in participating in the survey questionnaires. Using SPSS Version 23 software, Cronbach's alpha coefficient was used for reliability analysis and revealed that all measurement items have higher reliability values of p>0.70, which is 0.937.

Table 2 shows the demographic information of the respondents. The number of male respondents was higher than female respondents, with 46 male respondents (62.16%) and 28 female respondents (37.84%). Most of the respondents held a degree or professional qualification (48 or 64.86%), followed by a diploma (14 or 18.92%) and postgraduate degree (12 or 16.22%). In terms of years of experience in the renewable energy sector, 44 (59.46%) of them have less than five years of experience. Meanwhile, 25 respondents or 33.78% have 6–10 years of work experience (34.25%) and the other five respondents have 11–15 years of experience (6.76%). Most of the respondents work as project manager (43 or 58.11%), followed by senior manager (18 or 24.32%), CEO/Director of the organization (9 or 12.16%) and lastly, supervisor (4 or 5.41%). With regards to type of organizations, most of the

Table 2: Demographic Profile of Respondents

Demographic variables	Category	Respondents (N = 74)	
		Frequency	Percentage (%)
Gender	Male	46	62.16%
	Female	28	37.84%
Academic qualification	High school or below	0	0.00%
	Diploma	14	18.92%
	Degree or professional qualification	48	64.86%
	Postgraduate	12	16.22%
Years of experience	<5 years	44	59.46%
	610 years	25	33.78%
	1115 years	5	6.76%
	16–20 years	0	0.00%
	>20 years	0	0.00%
Job position	CEO/Director	9	12.16%
	Senior Manager	18	24.32%
	Project Manager	43	58.11%
	Supervisor	4	5.41%
Type of organization	Public utility	12	16.22%
	Private operator	54	72.97%
	Public-private partnerships	4	5.41%
	Associations	4	5.41%
Area of specialization	Biomass	19	25.68%
	Biogas	11	14.86%
	Mini-Hydro	6	8.11%
	Solar Photovoltaic	38	51.35%

respondents came from privately operated companies (54 or 72.97%). Secondly from public utility companies (12 or 16.22%) and from both public-private partnership and associations (4 or 5.41%). Lastly, in regard to the area of renewable energy specialization, most of the organizations were into solar photovoltaic (PV) sources with 38 numbers (51.35%), biomass with 19 numbers (25.68%), next is biogas sources with 11 number (14.86%) and mini-hydro with six number of organizations (8.11%).

Data Analysis and Results

Structural equation modeling (SEM) was used for data analysis and SmartPLS Version 3.0 software was chosen mainly due to its ability to model the latent constructs both formatively and reflectively (Sarstedt, Ringle, & Hair, 2018). The measurement model was first assessed, and this was followed by the assessment of the structural model.

Measurement Model Assessment

In assessing the measurement model, it is important to test the reliability, convergent validity, and discriminant validity of the measuring items. The convergent validity was assessed by considering the factor loadings, average variance extracted (AVE), and composite reliability (CR) Hair, Babin, & Krey, (2017). Table 3 indicates the details of convergent validity.The cut-off value for outer loadings are higher than 0.50, AVE values are more than 0.50, and CR values are above 0.70 (Hair Jr., Matthews, Matthews, & Sarstedt, 2017; Hair, Hollingsworth, Randolph, & Chong, 2017). The assessment of the measurement model shows that the outer loadings ranged from 0.732–0.884, AVE is 0.517–0.745, and CR is 0.768–0.896 values. However, as indicated in Table 3, the items for CC3, ISP1, RM1, CO1, and SUCC4 were removed because the constructs had not surpassed the cut-off value.

Besides, as this study proposed a second-order model, the convergent validity of the second-order construct was also assessed. The assessment on the second-order model shows that the outer loadings ranged from 0.600–0.832, AVE is 0.510–0.549, and CRis 0.842–0.906. The details of second-order constructs are illustrated in Table 4. Accordingly, based on the results, the convergent validity of both first and second-order constructs are satisfactory. Furthermore, in order to avoid the redundancy issues within each contracts, discriminant validity was utilized (Hair Jr., Matthews, Matthews, & Sarstedt, 2017). In this study, the discriminant validity was examined by using the Heterotrait-Monotrait (HTMT). HTMT is the ratio of the correlations that reflect the average of the heterotrait-heteromethod correlations relative to the average of the monotrait-heteromethod correlations (J. Hair et al., 2017). Henseler, Ringle, Rold´an, & Cepeda, (2015) suggested a threshold value of 0.90 if constructs

Table 3: Results of First-Order Constructs

Constructs	Items	Outer Loadings	Average Variance Extracted (AVE)	Composite Reliability (CR)
Understand Intention and Behaviours (UIB)	UIB1	0.771	0.617	0.829
	UIB2	0.755		
	UIB3	0.829		
Building Good Relationships (BSR)	BSR1	0.731	0.586	0.809
	BSR2	0.844		
	BSR3	0.715		
Effective Communication (EC)	EC1	0.783	0.628	0.835
	EC2	0.824		
	EC3	0.769		
Continuous Consultation (CC)	CC1	0.871	0.745	0.854
	CC2	0.855		
	CC3	Item Deleted		
Implement Strategies Plan (ISP)	ISP1	Item Deleted	0.751	0.858
	ISP2	0.876		
	ISP3	0.857		
Analyze Changes(AC)	AC1	0.800	0.672	0.860
	AC2	0.829		
	AC3	0.829		
Risk Mitigation (RM)	RM1	Item Deleted	0.754	0.860
	RM2	0.874		
	RM3	0.863		
Compromising Conflicts (CO)	CO1	Item Deleted	0.730	0.844
	CO2	0.824		
	CO3	0.884		
Understand Project Success (UPS)	UPS1	0.879	0.742	0.896
	UPS2	0.857		
	UPS3	0.847		
Good Project Governance (GPG)	GPG1	0.824	0.619	0.830
	GPG2	0.771		
	GPG3	0.765		
RE Project Success (SUCC)	SUCC1	0.868	0.517	0.768
	SUCC2	0.863		
	SUCC3	0.752		
	SUCC4	Item Deleted		

Table 4: Results of Second-Order Constructs

Constructs	Items		Outer Loadings	Average Variance Extracted (AVE)	Composite Reliability (CR)
Stakeholder Relations (SR)	Understand Intention and Behaviours (UIB)	UIB1	0.620	0.510	0.842
		UIB2	0.679		
		UIB3	0.772		
	Building Good Relationships (BSR)	BSR1	0.599		
		BSR2	0.739		
		BSR3	0.701		
Stakeholder Communication (SC)	Effective Communication (EC)	EC1	0.728	0.533	0.851
		EC2	0.752		
		EC3	0.708		
	Continuous Consultation (CC)	CC1	0.750		
		CC2	0.711		
		CC3	Item Deleted		
Stakeholder Learning (SL)	Implement Strategies Plan (ISP)	ISP1	Item Deleted	0.541	0.891
		ISP2	0.810		
		ISP3	0.757		
	Analyze Changes(AC)	AC1	0.600		
		AC2	0.651		
		AC3	0.713		
	Risk Mitigation (RM)	RM1	Item Deleted		
		RM2	0.811		
		RM3	0.780		
Stakeholder Integration (SI)	Compromising Conflicts (CO)	CO1	Item Deleted	0.549	0.906
		CO2	0.659		
		CO3	0.797		
	Understand Project Success (UPS)	UPS1	0.832		
		UPS2	0.778		
		UPS3	0.760		
	Good Project Governance (GPG)	GPG1	0.760		
		GPG2	0.565		
		GPG3	0.744		

are conceptually very similar and 0.85 if the constructs are conceptually more distinct. Table 5 shows the results of HTMT assessment indicating the highest HTMT values of 0.891which is below the threshold value of 0.90,thus implying that the discriminant validity was established. Overall, the measurement model of this study was considered acceptable with the evidence of satisfactory reliability, convergent validity, and discriminant validity.

Structural Model Assessment

Table 6 indicates the results of the structural model in this study. The results revealed that the stakeholder engagement indicators which were stakeholder relations, stakeholder communication, stakeholder learning and stakeholder integration were positively affecting the successful implementation of renewable energy projects. Chin, Jin Kim, & Lee, (2013) and Hayes & Preacher, (2014) suggested that the PLS bootstrapping based on 5000 bootstrap samples to derive a 95% bias corrected confidence interval are applicable to test the hypotheses. Table 6 shows that all the standardized β values relating to the independent variables and dependent variables are significant at p value <0.05 (t>1.650) with non-zero confidence intervals. This study also utilized the R-squared (R2) of regression analysis to determine how well the data collected fit with the regression model. The relationship between stakeholder engagement indicators and renewable energy project success was analyzed. According to Hair Jr. et al., (2017) the R^2 values of 0.25, 0.50, and 0.75 for targeted constructs are considered weak, moderate, and substantial. Table 6 shows the R^2 values for all endogenous latent variables in the structural

Table 5: Heterotrait-Monotrait ratio (HTMT) Results

	AC	BSR	CO	CC	EC	GPG	ISP	REPS	RM	SC	SI	SL	SR	UIB	UPS
AC															
BSR	0.863														
CO	0.853	0.804													
CC	0.387	0.525	0.525												
EC	0.670	0.669	0.728	0.841											
GPG	0.871	0.844	0.857	0.464	0.725										
ISP	0.702	0.830	0.858	0.810	0.570	0.754									
REPS	0.857	0.870	0.772	0.397	0.660	0.889	0.588								
RM	0.738	0.726	0.685	0.768	0.450	0.722	0.853	0.683							
SC	0.582	0.642	0.678	0.818	0.844	0.649	0.704	0.580	0.611						
SI	0.823	0.843	0.841	0.529	0.816	0.826	0.787	0.892	0.686	0.734					
SL	0.827	0.855	0.892	0.647	0.608	0.880	0.817	0.767	0.882	0.657	0.893				
SR	0.738	0.847	0.891	0.635	0.708	0.864	0.852	0.688	0.698	0.713	0.803	0.797			
UIB	0.554	0.848	0.883	0.680	0.680	0.709	0.796	0.455	0.608	0.716	0.744	0.670	0.814		
UPS	0.843	0.851	0.868	0.552	0.892	0.890	0.724	0.703	0.611	0.791	0.807	0.870	0.781	0.645	

Table 6: Summary of Hypotheses Testing of Structural Model

Hypotheses	Path	Standard Beta	t-value	R^2	Q^2	Supported
H1	SR → REPS	0.037	15.335	0.348	0.433	Yes
H2	SC →REPS	0.031	21.033	0.752	0.495	Yes
H3	SL → REPS	0.020	17.863	0.478	0.492	Yes
H4	SI → REPS	0.148	5.181	0.210	0.500	Yes

model. The R^2 values for stakeholder relations was 0.348 or 34.8%, and stakeholders' learning 47.8%, indicating medium effect towards renewable energy project success. Stakeholder integration presenting low effect with 21%. Meanwhile, stakeholder's communication indicates the substantial effects towards renewable energy project with R^2 value 75.2%.

Besides, blindfolding was applied to ensure the predictive relevance Q^2 of the model. The Q^2 shows the ability of a model in predicting endogenous variables. The results were extracted through the cross-validated redundancy and the model has a predictive relevance if the Q^2 values in all the endogenous variables are more than zero. The Q^2 values of 0.02, 0.15, and 0.35 signify small, medium, and large predictive relevance of certain latent variables(Hair et al., 2017). Referring to Table 6, it shows that all stakeholder engagement constructs had large relevancy toward the renewable energy project success.

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 indicators of stakeholder engagement and renewable energy project success. There were ten critical factors of stakeholder engagement identified in literature which were effective communication, continuous consultation, understand intention and behaviors, implement strategies plan, build good relationships, analyze changes, risk mitigation, compromise conflict, understand project success, and good project governance. These factors were grouped together into four elements which were stakeholder relations, stakeholders' communication, stakeholders' learning and stakeholder integration, which become the constructs of stakeholder engagement indicators.The details of the results are illustrates in Figure 2.

Firstly, the findings indicate that the stakeholder communication has the most significant impact towards renewable energy project success. This was proven with the highest estimated path coefficient β-value 0.810. Thus, it implies that for delivering successful renewable energy projects, the companies need to focus more on stakeholder communication during stakeholder engagement process. Consistent with previous studies, the development and deployment of renewable energy projects can

be successfully implemented if project managers emphasize effective communication among all key stakeholders involved (Heravi, Coffey, & Trigunarsyah, 2015). Apart from that, the importance of effective communication among stakeholders will help the project managers to identify the salient stakeholder's groups. 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 confusion and conflicts of what stakeholders primarily want. An essential step to overcoming this issue is to continuously consult the relevant stakeholders by getting their needs, requirements, and expectations.

Secondly, the results of this study presented that stakeholders' learning has a significant positive relationship towards renewable energy project success. This was supported with the estimated path coefficient β-value 0.780. The respondent agreed that in order to achieve successful development of renewable energy projects, the companies need to learn and get inputs from all stakeholders involved so that the strategic stakeholder engagement plan, systematic analyzing changes, and risk mitigation can be implemented. This, consistent with previous study by 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. Apart from that, the results also agreed that analyzing changes and mitigation of risk are essential in determining the renewable energy project success. These 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.

Thirdly, the significant positive relationship between stakeholder relations and renewable energy project success was proven with the estimated path coefficient β-value 0.702. The results indicate that renewable energy projects will be successfully developed and implemented if more endeavors are taken in strengthening stakeholder relationship. This is supported in literature that public perceptions convey important aspects in developing and deployment of renewable energy initiatives. Previous research also has strongly focused on the internal stakeholders while little attention has been given 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,

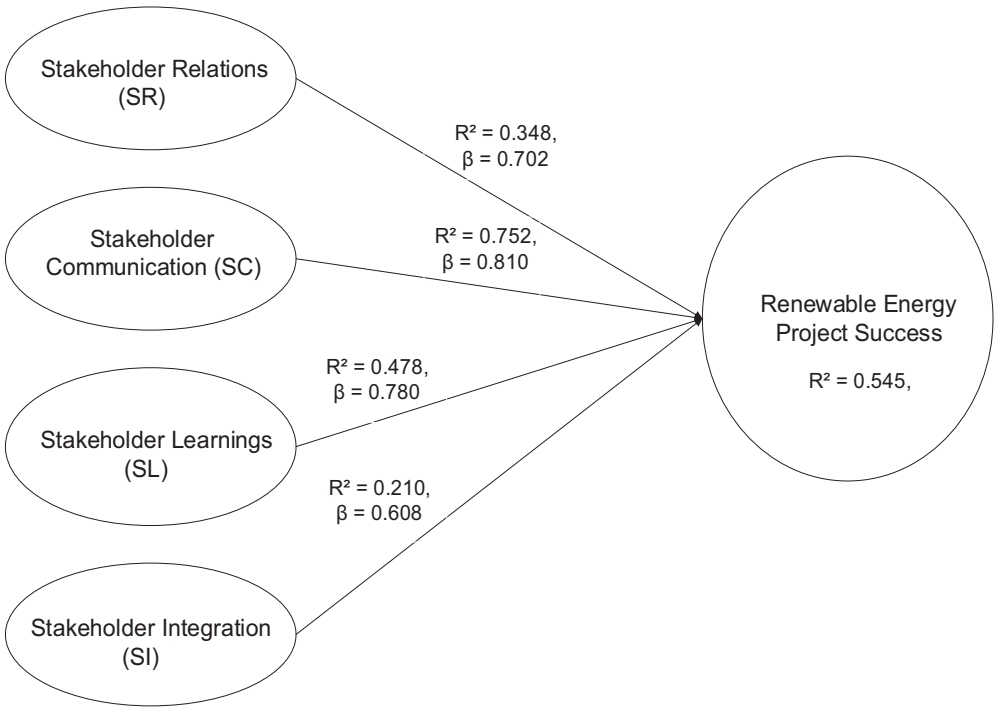

Figure 2: Results of model testing

Petrini, Santos, & Silveira (2018)found that 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. Besides, the results pointed out that in order to deliver successful project outcomes, it is necessary to understand the underlying intentions and behaviors of stakeholders. Bal (2014) reinforced this view and stated that a proper identification process is an important step to distinguish different stakeholders' needs and expectations. If the project members are clearly identified, then it will be easier for the leaders to involve and communicate with them.

Lastly, the results of this study indicate the significant relationship between stakeholder integration and renewable energy project success. This is supported with the path coefficient β-value of 0.608. The findings confirmed integration of stakeholder engagement will create value and benefits to the project's stakeholders. Respondents agree that by considering stakeholder integration, stakeholders will be able to compromise conflict, better understand project success and good project governance. It is suggested that by compromising conflicts, project disputes will be resolved in proper mechanism such as facilitation, negotiation, mediation, and arbitration. These dispute resolutions will help to resolve differences among stakeholders before and after they reach the stage of a dispute(Heravi, 2014). Meanwhile the development of renewable energy projects brings a wide variety of economic, environmental, and social benefits; the challenges in implementing these projects are also inevitable. Therefore, understanding project success and good project governance is the proper mechanism for engaging all stakeholders involved.

Conclusion and Research Implications

This study considers stakeholder engagement in the context of renewable energy projects in Malaysia by providing insights into investigating the stakeholder engagement indicators as the important drivers on renewable energy project success. The results obtained from this study as the empirical testing of the conceptual framework indicate significant positive relationship between independent and dependent variables. Overall, the hypothesis of this study shows that stakeholder relations, stakeholders' communication, stakeholders' learning and stakeholder integration were positively significant towards the renewable energy project success. The findings of this study also reveal that the respondents were aware of the significance of stakeholder engagement, however, their level of understanding of the issues was constructed through experience, and not based on any framework, standards, or other formal instruction/documentation. Apart from that, the respondents agree that effective stakeholder engagement among companies and relevant stakeholders was an important approach for tackling the barriers and challenges in development of renewable energy projects in Malaysia.

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 et al., (2010) by empirically validating an amplified conceptual model consisting indicators and critical factors of stakeholder engagement. Compared with 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 further research. Freeman et al., (2017) emphasized that stakeholder engagement is undoubtedly seen as practical approach of stakeholder theory, thus, the purpose of this study will provide examples and best practices on how companies should engage with the stakeholders. Apart from that, since renewable energy and sustainable development are trendiest agenda worldwide, the stakeholder engagement framework in this study may yield findings that contribute to bridge the knowledge gaps between the project management area and the uniqueness of renewable energy projects.

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 projects in Malaysia. Lastly, this study is an attempt to highlight the roles of stakeholder engagement in development and deployment of renewable energy projects and helping Malaysian government in achieving the target of renewable energy generation up to 20% by year 2025.

Competing Interests

No potential conflict of interest was reported by the author(s).

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References

Aaltonen, K., & Kujala, J. (2016). Towards an improved understanding of project stakeholder landscapes. *International Journal of Project Management*, *34*(8), 1537–1552. https://doi.org/10.1016/j.ijproman.2016.08.009

Aaltonen, K., & Sivonen, R. (2009). Response strategies to stakeholder pressures in global projects. *International Journal of Project Management*, *27*(2), 131–141. https://doi.org/10.1016/j.ijproman.2008.09.007

Agyapong, L. K. (2017). *Quantitative Study To Determine Relationship Between Stakeholder Management Attributes and Project Success*. (September).

Aragonés-Beltrán, P., García-Melón, M., & Montesinos-Valera, J. (2017). How to assess stakeholders' influence in project management? A proposal based on the Analytic Network Process. *International Journal of Project Management*, *35*(3), 451–462. https://doi.org/10.1016/j.ijproman.2017.01.001

Bal, M. (2014). *Stakeholder Engagement and Sustainability-Related Project Performance in Construction*. Liverpool John Moores University.

Bal, M., Bryde, D., Fearon, D., & Ochieng, E. (2013). Stakeholder Engagement: Achieving Sustainability in the Construction Sector. *Sustainability (Switzerland)*, *6*(2), 695–710. https://doi.org/10.3390/su5020695

Baudry, G., Delrue, F., Legrand, J., Pruvost, J., & Vallée, T. (2017). The challenge of measuring biofuel sustainability: A stakeholder-driven approach applied to the French case. *Renewable and Sustainable Energy Reviews*, *69*, 933–947. https://doi.org/10.1016/j.rser.2016.11.022

Bellucci, M., & Manetti, G. (2019). Stakeholder Engagement and Sustainability Reporting. In *Routledge*. https://doi.org/10.1057/crr.2015.9

Bourne, L. (2015). *Series on Effective Stakeholder Engagement: Stakeholder Identification and Prioritisation*. *IV*(V), 1–6.

Bukarica, V., & Robić, S. (2013). Implementing energy efficiency policy in Croatia: Stakeholder interactions for closing the gap. *Energy Policy*, *61*, 414–422. https://doi.org/10.1016/j.enpol.2013.06.052

Cabrera-Nguyen, P. (2010). Author Guidelines for Reporting Scale Development and Validation Results in the Journal of the Society for Social Work and Research . *Journal of the Society for Social Work and Research*, *1*(2), 99–103. https://doi.org/10.5243/jsswr.2010.8

Chan, A. P. C., & Oppong, G. D. (2017). Managing the expectations of external stakeholders in construction projects. *Engineering, Construction and Architectural Management*, *24*(5), 736–756. https://doi.org/10.1108/ECAM-07-2016-0159

Chin, W. W., Jin Kim, Y., & Lee, G. (2013). Paths in PLS Analysis: A Bootstrapping Approach. In *New Perspectives in Partial Least Squares and Related Methods,* (56). https://doi.org/10.1007/978-1-4614-8283-3

Cuppen, E., Bosch-Rekveldt, M. G. C., Pikaar, E., & Mehos, D. C. (2016). Stakeholder engagement in large-scale energy infrastructure projects: Revealing perspectives using Q methodology. *International Journal of Project Management*, *34*(7), 1347–1359. https://doi.org/10.1016/j.ijproman.2016.01.003

Davidson, L. (2017a). Stakeholder Engagement Project Resource - Stakeholder Analysis.

Davidson, L. (2017b). *You will never make it alone : How to successfully engage your stakeholders*. Associaton for Project Management.

Davis, K. (2014). Different stakeholder groups and their perceptions of project success. *International Journal of Project Management*, *32*(2), 189–201. https://doi.org/10.1016/j.ijproman.2013.02.006

De Schepper, S., Dooms, M., & Haezendonck, E. (2014). Stakeholder dynamics and responsibilities in Public-Private Partnerships: A mixed experience. *International Journal of Project Management*, *32*(7), 1210–1222. https://doi.org/10.1016/j.ijproman.2014.01.006

Dhanesh, G. S. (2017). Putting engagement in its PRoper place: State of the field, definition and model of engagement in public relations. *Public Relations Review*, *43*(5), 925–933. https://doi.org/10.1016/j.pubrev.2017.04.001

Di Maddaloni, F., & Davis, K. (2017). The influence of local community stakeholders in megaprojects: Rethinking their inclusiveness to improve project performance. *International Journal of Project Management*, *35*(8), 1537–1556. https://doi.org/10.1016/j.ijproman.2017.08.011

Dusyk, N. (2013). *The transformative potential of participatory politics : energy planning and emergent sustainability in British Columbia, Canada*. (April), 1–204. https://doi.org/10.14288/1.0073723

El-Sawalhi, N. I., & Hammad, S. (2015). Factors affecting stakeholder management in construction projects in the Gaza Strip. *International Journal of Construction Management*, *15*(2), 157–169. https://doi.org/10.1080/15623599.2015.1035626

Energy Commission of Malaysia. (2016). Performance and Statistical Information in Malaysia 2016. *Suruhanjaya*

Tenaga, 103. Retrieved from https://meih.st.gov.my/documents/10620/88cc637b-3d79-4597-8458-a3ac380ecac2

Eskerod, P., Huemann, M., & Ringhofer, C. (2015). Stakeholder inclusiveness: Enriching project management with general stakeholder theory. *Project Management Journal*, *46*(6), 42–53. https://doi.org/10.1002/pmj.21546

Fernando, Y., & Wah, W. X. (2017). The impact of eco-innovation drivers on environmental performance: Empirical results from the green technology sector in Malaysia. *Sustainable Production and Consumption*. https://doi.org/10.1016/j.spc.2017.05.002

Freeman, R. E., Harrison, J., Hicks, A., Parmar, B., & Colle, S. de. (2010). Stakeholder Theory: The State of the Art. In *Cambridge University Press*. https://doi.org/10.1192/bjp.111.479.1009-a

Freeman, R. E., Kujala, J., & Sachs, S. (2017). *Stakeholder Engagement: Clinical Research Cases* (Issues in, Vol. 46; R. Edward Freeman, J. Kujala, & S. Sachs, Eds.). https://doi.org/10.1007/978-3-319-62785-4

Hair, J. F., Babin, B. J., & Krey, N. (2017). Covariance-Based Structural Equation Modeling in the Journal of Advertising: Review and Recommendations. *Journal of Advertising*, *46*(1), 163–177. https://doi.org/10.1080/00913367.2017.1281777

Hair, J., Hollingsworth, C. L., Randolph, A. B., & Chong, A. Y. L. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management and Data Systems*, *117*(3), 442–458. https://doi.org/10.1108/IMDS-04-2016-0130

Hair Jr., J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, *1*(2), 107. https://doi.org/10.1504/ijmda.2017.10008574

Hannan, M. A., Begum, R. A., Abdolrasol, M. G., Hossain Lipu, M. S., Mohamed, A., & Rashid, M. M. (2018). Review of baseline studies on energy policies and indicators in Malaysia for future sustainable energy development. *Renewable and Sustainable Energy Reviews*, *94*(May), 551–564. https://doi.org/10.1016/j.rser.2018.06.041

Hayes, A. F., & Preacher, K. J. (2014). *Statistical Mediation Analysis with a Multicategorical Independent Variable*.

Henseler, J., Ringle, C., Rold´an, J., & Cepeda, G. (2015). Constantly Moving PLS Path Mod- eling Forward: Two Steps Ahead - No Steps Back! *2nd International Symposium on Partial Least Squares Path Modeling, TheConferencefor PLS Users*.

Heravi, A., Coffey, V., & Trigunarsyah, B. (2015). Evaluating the level of stakeholder involvement during the project planning processes of building projects. *International Journal of Project Management*, *33*(5), 985–997. https://doi.org/10.1016/j.ijproman.2014.12.007

Heravi, A. H. (2014). *Improving Construction Management: An Investigation Into The Influences Of Effective Stakeholder Involvement On Project Quality Outcomes* (Queensland University of Technology). https://doi.org/10.13031/aea.31.10729

Jami, A. A. N., & Walsh, P. R. (2014). The role of public participation in identifying stakeholder synergies in wind power project development: The case study of Ontario, Canada. *Renewable Energy*, *68*, 194–202. https://doi.org/10.1016/j.renene.2014.02.004

Jing, Y. (2010). *A Framework For Stakeholder Management In Construction Projects* (The Hong Kong Polytechnic University). https://doi.org/10.1016/B978-012397720-5.50034-7

Joshi, D. (2018). *Evaluating the Performance of the Sustainable Energy Development Authority (SEDA) and Renewable Energy Policy in Malaysia*. Retrieved from https://penanginstitute.org/wp-content/uploads/2018/06/Evaluating-the-Performance-of-SEDA-and-RE-Policy-in-Malaysia_PI_Darshan_5-June-2018.pdf

Kahla, F. (2017). Implementation of a balanced scorecard for hybrid business models – an application for citizen renewable energy companies in Germany. *International Journal of Energy Sector Management*, *11*(3), 426–443. https://doi.org/10.1108/IJESM-09-2016-0004

Kelly-Richards, S., Silber-Coats, N., Crootof, A., Tecklin, D., & Bauer, C. (2017). Governing the transition to renewable energy: A review of impacts and policy issues in the small hydropower boom. *Energy Policy*, *101*, 251–264. https://doi.org/10.1016/j.enpol.2016.11.035

Konkel, R. S. (2013). Renewable energy and sustainable communities: Alaska's wind generator experience. *International Journal of Circumpolar Health*, *72*(SUPPL.1). https://doi.org/10.3402/ijch.v72i0.21520

Lee, N. C., & Leal, V. M. S. (2014). A review of energy planning practices of members of the Economic Community of West African States. *Renewable and Sustainable Energy Reviews*, *31*, 202–220. https://doi.org/10.1016/j.rser.2013.11.044

Lehtinen, J., Aaltonen, K., & Rajala, R. (2018). Stakeholder management in complex product systems: Practices and rationales for engagement and disengagement. *Industrial Marketing Management*, (November 2017), 1–13. https://doi.org/10.1016/j.indmarman.2018.08.011

Lynda Bourne. (2018). *The value of effective stakeholder engagement* (p. 10). Retrieved from https://mosaicprojects.com.au/PDF_Papers/P175-Value_of_SHM.pdf

Lynda Bourne. (2017a). Effective Stakeholder Engagement is Multifaceted | Mosaicproject's Blog. Retrieved April 17, 2019, from https://mosaicprojects.wordpress.com/2017/11/03/effective-stakeholder-engagement-is-multifaceted/

Lynda Bourne. (2017b). Effective Stakeholder Engagement is Multifaceted | Stakeholder Management's Blog. Retrieved April 17, 2019, from stakeholdermanagement.wordpress.com website: https://stakeholdermanagement.wordpress.com/2017/11/03/effective-stakeholder-engagement-is-multifaceted/

Maqbool, R., & Sudong, Y. (2018). Critical success factors for renewable energy projects; empirical evidence from Pakistan. *Journal of Cleaner Production*, *195*, 991–1002. https://doi.org/10.1016/j.jclepro.2018.05.274

McKinley, E., & Ballinger, R. C. (2018). Welsh legislation in a new era: A stakeholder perspective for coastal management. *Marine Policy*, *97*, 253–261. https://doi.org/10.1016/j.marpol.2018.06.005

MESTECC. (2019). MESTECC 2019 Initiative. Retrieved June 30, 2019, from Ministry of Energy, Science, Technology, Environment and Climate Change website: http://inisiatif.mestecc.gov.my/core/1st_sector/1.1.1_ms.html

Mojtahedi, M., & Oo, B. L. (2017a). Critical attributes for proactive engagement of stakeholders in disaster risk management. *International Journal of Disaster Risk Reduction*, *21*, 35–43. https://doi.org/10.1016/j.ijdrr.2016.10.017

Mojtahedi, M., & Oo, B. L. (2017b). The impact of stakeholder attributes on performance of disaster recovery projects: The case of transport infrastructure. *International Journal of Project Management*, *35*(5), 841–852. https://doi.org/10.1016/j.ijproman.2017.02.006

Mok, K. Y., Shen, G. Q., & Yang, J. (2015). Stakeholder management studies in mega construction projects: A review and future directions. *International Journal of Project Management*, *33*(2), 446–457. https://doi.org/10.1016/j.ijproman.2014.08.007

Mok, K. Y., Shen, G. Q., Yang, R. J., & Li, C. Z. (2017). Investigating key challenges in major public engineering projects by a network-theory based analysis of stakeholder concerns: A case study. *International Journal of Project Management*, *35*(1), 78–94. https://doi.org/10.1016/j.ijproman.2016.10.017

Molwus, J. J. (2014). *Stakeholder Management In Construction Projects : A Life Cycle Based Framework: A PhD Thesis in Construction, Heriot Watt University, Edinburgh*.

Müller, R., & Jugdev, K. (2012). Critical success factors in projects. *International Journal of Managing Projects in Business*, *5*(4), 757–775. https://doi.org/10.1108/17538371211269040

Oppong, G. D., Chan, A. P. C., & Dansoh, A. (2017). A review of stakeholder management performance attributes in construction projects. *International Journal of Project Management*, *35*(6), 1037–1051. https://doi.org/10.1016/j.ijproman.2017.04.015

Pagnussatt, D., Petrini, M., Santos, A. C. M. Z. dos, & Silveira, L. M. da. (2018). What do local stakeholders think about the impacts of small hydroelectric plants? Using Q methodology to understand different perspectives. *Energy Policy*, *112*, 372–380. https://doi.org/10.1016/j.enpol.2017.10.029

Pillay, S. (2010). *A critical analysis of the role of stakeholder engagement in establishing the renewable energy sector in South Africa*. PMI. (2017). *A guide to the project management body of knowledge (PMBOK guide)* (Sixth). USA: Project Management Institute, Inc.

Rajablu, M., Marthandan, G., & Yusoff, W. F. W. (2014). Managing for stakeholders: The role of stakeholder-based management in project success. *Asian Social Science*, *11*(3), 111–125. https://doi.org/10.5539/ass.v11n3p111

Richard, E., & David, L. F. (2018). The future of citizen engagement in cities—The council of citizen engagement in sustainable urban strategies (ConCensus). *Futures*, *101*(May 2017), 80–91. https://doi.org/10.1016/j.futures.2018.06.012

Rühli, E., Sachs, S., Schmitt, R., & Schneider, T. (2017). Innovation in Multistakeholder Settings: The Case of a Wicked Issue in Health Care. *Journal of Business Ethics*, *143*(2), 289–305. https://doi.org/10.1007/s10551-015-2589-1

Sachs, S., & Rühli, E. (2011). Stakeholders matter: A new paradigm for strategy in society. In *Stakeholders Matter: A New Paradigm for Strategy in Society*. https://doi.org/10.1017/CBO9781139026963

Sadhukhan, J., Martinez-Hernandez, E., Murphy, R. J., Ng, D. K. S., Hassim, M. H., Siew Ng, K., … Andiappan, V. (2018). Role of bioenergy, biorefinery and bioeconomy in sustainable development: Strategic pathways for Malaysia. *Renewable and Sustainable Energy Reviews*, *81*, 1966–1987. https://doi.org/10.1016/j.rser.2017.06.007

San-Jose, L., Retolaza, J. L., & Freeman, R. E. (2017). *Stakeholder Engagement at Extanobe: A Case Study of the New Story of Business*. https://doi.org/10.1007/978-3-319-62785-4_13

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2018). *Partial Least Squares Structural Equation Modeling 267*. https://doi.org/10.1007/978-3-319-71691-6

Sawandi, N. (2014). *Authentic, strategic and symbolic stakeholder engagement: an evaluation of CSR and accountability practices in Malaysian unit trust industry*. Retrieved from http://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.618880

Senaratne, S., & Ruwanpura, M. (2016). Communication in construction: a management perspective through case studies in Sri Lanka. *Architectural Engineering and Design Management*, *12*(1), 3–18. https://doi.org/10.1080/17452007.2015.1056721

Sherriff, L. (2012). Delivering Renewable Energy Projects through Stakeholder Engagement. *Electricity Engineers Association Conference and Trade Exhibition*, 1–9.

Takim, R. (2009). The Management of Stakeholders' Needs and Expectations in the Development of Construction Projects in Malaysia. *Modern Applied Science*, *3*(5), 167–175. Retrieved from www.ccsenet.org/journal.html, available 17/11/2010.

Tang, L. Y., & Shen, Q. (2013). Factors affecting effectiveness and efficiency of analyzing stakeholders' needs at the briefing stage of public private partnership projects. *International Journal of Project Management*, *31*(4), 513–521. https://doi.org/10.1016/j.ijproman.2012.10.010

Thomas, S., Richter, M., Lestari, W., Prabawaningtyas, S., Anggoro, Y., & Kuntoadji, I. (2018). Transdisciplinary research methods in community energy development and governance in Indonesia: Insights for sustainability science. *Energy Research and Social Science*, *45*, 184–194. https://doi.org/10.1016/j.erss.2018.06.021

Toor, S. u R., & Ogunlana, S. O. (2010). Beyond the "iron triangle": Stakeholder perception of key performance indicators (KPIs) for large-scale public sector development projects. *International Journal of Project Management*, *28*(3), 228–236. https://doi.org/10.1016/j.ijproman.2009.05.005

Wehn, U., Collins, K., Anema, K., Basco-Carrera, L., & Lerebours, A. (2018). Stakeholder engagement in water governance as social learning: lessons from practice. *Water International*, *43*(1), 34–59. https://doi.org/10.1080/02508060.2018.1403083

Xavier, R., Komendantova, N., Jarbandhan, V., & Nel, D. (2017). Participatory governance in the transformation of the South African energy sector: Critical success factors for environmental leadership. *Journal of Cleaner Production*, *154*, 621–632. https://doi.org/10.1016/j.jclepro.2017.03.146

Xu, S., Chu, C., Zhang, Y., Ye, D., Wang, Y., & Ju, M. (2018). Entangled stakeholder roles and perceptions of sustainable consumption: An evaluation of sustainable consumption practices in Tianjin, China. *Journal of Environmental Management*, *223*, 841–848. https://doi.org/10.1016/j.jenvman.2018.07.007

Yang, J., Shen, G. Q., Ho, M., Drew, D. S., & Chan, A. P. C. (2009). Exploring Critical Success Factors for Stakeholder Management in Construction Projects. *Journal of Civil Engineering and Management*, *15*(4), 337–348. https://doi.org/10.3846/1392-3730.2009.15.337-348

Yu, J., & Leung, M. yung. (2015). Exploring factors of preparing public engagement for large-scale development projects via a focus group study. *International Journal of Project Management*, *33*(5), 1124–1135. https://doi.org/10.1016/j.ijproman.2015.01.015

Yu, T., Shen, G. Q., Shi, Q., Lai, X., Li, C. Z., & Xu, K. (2017). Managing social risks at the housing demolition stage of urban redevelopment projects: A stakeholder-oriented study using social network analysis. *International Journal of Project Management*, *35*(6), 925–941. https://doi.org/10.1016/j.ijproman.2017.04.004

Zhang, Y., Loh, C., Louie, P. K. K., Liu, H., & Lau, A. K. H. (2018). The roles of scientific research and stakeholder engagement for evidence-based policy formulation on shipping emissions control in Hong Kong. *Journal of Environmental Management*, *223*, 49–56. https://doi.org/10.1016/j.jenvman.2018.06.008

Zhou, Y., Cheung, C. M., & Hsu, S. C. (2017). A dimensional model for describing and differentiating project teams. *International Journal of Project Management*, *35*(6), 1052–1065. https://doi.org/10.1016/j.ijproman.2017.04.001.

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