International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 01-13
DOI: 10.35631/IJEMP.830001

INTERNATIONAL JOURNAL OF ENTREPRENEURSHIP AND MANAGEMENT PRACTICES (IJEMP)
www.ijemp.com

THE ROLE OF PUBLIC-PRIVATE PARTNERSHIPS: PROMOTING SUSTAINABLE ENERGY INFRASTRUCTURE IN MALAYSIA

Alyaa Adeela Md Sharif[1], Mohamad Amir Junih[2], Yasmin Syazwani Mohd Yazid[3], Hanafi Haron[4], Ashran Haji Idris[5], Mohd Haris Abdul Rani[6*]

[1] Faculty of Law, Universiti Teknologi MARA, Malaysia
Email: 2022748643@student.uitm.edu.my
[2] Faculty of Law, Universiti Teknologi MARA, Malaysia
Email: 2022748443@student.uitm.edu.my
[3] Faculty of Law, Universiti Teknologi MARA, Malaysia
Email: 2022736975@student.uitm.edu.my
[4] Center of Innovation and Technology Transfer, Universiti Kebangsaan Malaysia, Malaysia
Email: hanafiharon@ukm.edu.my
[5] Faculty of Law, Universiti Teknologi MARA, Malaysia
Email: ashran709@uitm.edu.my
[6] Faculty of Law, Universiti Teknologi MARA, Malaysia
Email: harisrani@uitm.edu.my
[*] Corresponding Author

Article Info:

Article history:
Received date: 23.02.2025
Revised date: 19.03.2025
Accepted date: 29.04.2025
Published date: 04.06.2025

To cite this document:

Sharif, A. A. M., Junih, M. A., Yazid, Y. S. M., Haron, H., Haji Idris, A., & Abdul Rani, M. H. (2025). The Role Of Public-Private Partnerships: Promoting Sustainable Energy Infrastructure In Malaysia. *International Journal of Entrepreneurship and Management Practices, 8* (30), 01-13.

Abstract:

Public-private partnerships (PPPs) have emerged as a powerful instrument in addressing issues in the construction of sustainable energy infrastructure, particularly in the transition to renewable energy. This study examines the legal, financial, and regulatory frameworks supporting PPPs to determine how they assist Malaysia in building sustainable energy infrastructure. It assesses the congruence of PPP models with Malaysia's aims for energy transition, especially concerning significant renewable sources, namely solar and biomass. In this context, this paper tries to understand the implications of PPP initiatives towards sustainable development through case studies, particularly concerning how they reduce market risks and the tendency to monopolistic behaviour. Furthermore, it highlights the various regulatory and financial barriers that impede the effectiveness of public-private partnerships in Malaysia. The report contrasts Malaysia's practices in specifying PPPs with foreign models. It proposes a policy enhancement in utilising PPPs in the development of sustainable energy in the country and addresses Malaysia's source of low carbon economy, energy security, and infrastructure robustness. This study identifies and critiques critical legal, financial, and regulatory

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 01-13
DOI: 10.35631/IJEMP.830001

DOI: 10.35631/IJEMP.830001.

shortcomings, demonstrating how these structural weaknesses hinder renewable energy development in Malaysia.

Keywords:

Public-Private Partnerships, Renewable Energy, Sustainable, Malaysia

Introduction

As of now, the rate of energy consumption is increasing day by day. To prevent an undersupply of energy globally, countries must find a way to build a sustainable infrastructure that can keep up with the constant demand for energy worldwide. At the same time, they must also find a way to reduce the environmental impact of massive energy production. Malaysia is one of the many countries making a considerable effort to ensure that the over-reliance on fossil fuels is slowly changed towards a more sustainable method: renewable energy sources. At the same time, this renewable energy provides lower carbon emissions and better energy security, which supports global climate goals or sustainable development goals (SDGs). However, providing a vast sector of sustainable energy infrastructure, especially in the renewable energy sector such as solar, hydro or biomass sector, requires massive funding from various parties, not only the government. It requires financial investments, a supportive legal framework to assist it, and technologies that can ensure the smooth operation of sustainable energies (Shafie & Othman, 2019). These initiatives also align to ensure that natural resources are used wisely and sustainably to be conserved for future generations, as highlighted in the Rio Declaration on Environment and Development (1992).

The existence of PPP brings together the public and private entities together. Through this two-way relationship, they can share their resources and, more importantly, ensure that both parties are liable for their investment risks in high-scale projects. PPP is essential to tackling two main issues: the high investment cost and the volatile market conditions (Widyastuti & Wicaksono, 2020). When it comes to renewable energy projects that are on a massive scale, they come with hefty costs, and the government will find difficulties in providing stable funding. Furthermore, with problems like the everchanging energy prices that constantly fluctuate and the absence of the necessary technology, it is more complicated to bring in investors in the energy market (Abdullah & Zain, 2018). The existence of PPP evenly spreads financial problems, risks, and technological uncertainties between the government and private sector, helping both parties with their respective advantages. It would then boost more investors in renewable energy projects, accelerating the development of Malaysia's renewable energy progress (Ali & Ahmad. 2021).

To boost the growth of the renewable energy sector, Malaysia has implemented various methods, such as creating the Renewable Energy Act 2011 to boost Public-Private Partnerships. For example, as an incentive, this law pays the private sector well for their energy production. The guidance from Public Private Partnership Unit, Prime Minister's Department (UKAS), helps government and private companies work together in ways that benefit both sides, according to Kamaruzzaman and Mustaffa (2022). Despite their numerous efforts, Malaysia still faces difficulties implementing its PPP system. Confusing rules surrounding renewable energy make private investors reluctant to put all their money into renewable projects (Rashid & Husni, 2019). Investors will not risk money in renewables unless laws explain things better and work in sync, so companies have faith that they can handle items securely.

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 01-13
DOI: 10.35631/IJEMP.830001

This research explores how Public-Private Partnerships contribute to Malaysia's progress towards sustainable energy solutions. This report will cover two crucial areas: it will carefully examine the current financial picture of the renewable energy industry and assess the legal system that governs it (Mamat & Ibrahim, 2019). By checking real-life PPP examples, this paper will deeply analyse whether PPPs effectively manage common problems like high financing costs and technology gaps. Malaysia uses PPP to reach environmental goals while improving its energy security (Murshed & Hossain, 2020). Since finding out how well public-private partnerships work is key to our research, we look at them from a public-private partnership viewpoint to learn how Malaysia can better develop renewable energy sources.

Through the comparative analysis of countries with powerful PPP models in sustainable energy, such as the United Kingdom, Germany, and Japan, with Malaysia's practises of PPP. By referring to another country, Malaysia's PPP can expand its policies, especially in promoting private investment and innovation, because of the wise information from other countries (Ghosh, 2021). Therefore, it can help Malaysia's PPP improve their system, make the rules stricter, and make them more attentive to financial incentives.

Despite that, Malaysia has made respectable progress in promoting the PPPs for developing renewable energy. However, the current PPP frameworks still lack the incentives and legal comprehensive required to promote their framework with the private sector involved. This restriction has made it difficult for PPPs to efficiently support Malaysia's energy transition objectives. Besides, it is still unknown how Malaysia's energy sector stands up to its PPP strategy against the effective global model, which brought them insightful information. Therefore, this study examines how PPPs should contribute more to sustainable energy infrastructure in Malaysia. Hence, this paper aims to suggest a few insightful suggestions for Malaysia to improve their PPP framework by analysing the existing legal, regulatory, and financial frameworks through case studies to better support the energy transition and sustainability goals.

Literature Review

Overview of Public-Private Partnerships in Renewable Energy

PPPs have become a reliable method to tackle the problems before this in building a sustainable energy infrastructure, such as funding problems, unclear legal frameworks, and the lack of proper technology. When it comes to massive renewable energy mega projects, PPPs ensure that the problems that funding are channelled by both the public and private sectors, which allows secure funding throughout the project and removes the risk which had scared off many investors in the renewable energy sector and provides a safety net to them (Shafie & Othman, 2019). PPP play critical role in accelerating renewable energy transitions globally (Bank, 2022).

The National Renewable Energy Policy and Action Plan was introduced under the 10th Malaysia Plan in 2010 with the objectives of increasing renewable energy's contribution to the energy mix, supporting the renewable energy sector's growth, encouraging the affordability of renewable energy, promoting environmental preservation and raising public awareness on renewable energy's importance (Mekhilef, 2014). Since then, Malaysia has employed various strategies to support the growth of the renewable energy sector, including introducing the Renewable Energy Act 2011 to promote Public-Private Partnerships. For example, the law helps private investment by granting feed-in tariffs to the private sector. Furthermore, UKAS

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 01-13
DOI: 10.35631/IJEMP.830001

rules may encourage mutually beneficial public-private collaborations (Kamaruzzaman & Mustaffa, 2022). Despite these efforts, there are still specific issues with adopting Malaysia's PPP system. Vague rules governing renewable energy sometimes hinder private investors from fully engaging in renewable energy projects (Rashid & Husni, 2019). Other than that, inadequate financial incentives to the extent that slowed down the development of the renewable energy sector and the fragmentation of implementation in the development of these initiatives have resulted in significant delays and an increase in unwanted costs from the initial investment. This echoing, for example, in Malaysia's solar and biomass PPP projects (Rashidi et al., 2022).

Financial Barriers to Renewable Energy PPPs

Regarding PPPs, the most crucial aspect is financial. Without funding and massive financial support, it would be nearly impossible for a project in the renewable energy sector to be developed. It always requires a substantial amount of funding. For example, the amount of money to buy a solar panel to equip a solar farm can reach billions if made in a vast area of thousands of acres. Thus, it is always risky for one party to invest in the renewable energy sector. However, the existence of PPPs can help by spreading the financial risks between the public and private sectors, making these projects feasible for both parties (Ali & Ahmad, 2021). Nevertheless, Malaysia's current financial incentives, like tax breaks and subsidies, are insufficient to attract large-scale private investment.

As for case studies in Malaysia, we can refer to the 50MW solar park in Kedah, developed under a PPP framework. It faced various delays due to financing problems. Although public guarantees were in place, private investors wanted more risk-sharing mechanisms, such as long-term power purchase agreements, to ensure that they would not be the only party that would suffer losses if things were to go sideways during the projects, and this was found to be lacking (Kamaruzzaman & Mustaffa, 2022). To tackle these challenges, adopting financial models like the UK's Contracts for Difference (CfD) mechanism could offer more certainty and assurance to investors by stabilising electricity prices over time (Ghosh, 2021). This would then ensure that massive PPP collaboration projects would no longer face any financial difficulties due to doubts from investors.

Regulatory Challenges and Ambiguities

Republican perspective is another crucial determinant that can explain the success of PPPs. In Malaysia, however, it is the federated form of government that creates overlapping jurisdictions among federal and state authorities that appear to cause some delays and uncertainties in the approval of projects. For instance, renewable energy projects in Sabah have encountered stumbling blocks because of disagreement on their regulatory framework between the Energy Commission and local authorities (Rashid & Husni, 2019).

There are neither new legal frameworks nor specific legislation for PPP in Malaysia (Pushpan Murugiah, 2022). PPP, through UKAS, operates using the organization's guideline, the Privatization of Masterplan, and other significant national policies. Despite having PPP 1.0 launched in 2009, to PPP 3.0, the guidelines are very general and do not have an established mechanism for dealing with the unsolicited.

It suffices to mention that PPPs in the renewable energy arena are being aggravated in Germany, for instance, by simplifying the regulatory framework. The German Renewable Energy Sources Act (EEG) is quite structural. It makes compliance requirements easy and

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 01-13
DOI: 10.35631/IJEMP.830001

outlines crucial information to private investors, accelerating the speed of performing projects (Puthucheary & Suryadi, 2021). Using similar measures, Malaysia could improve its PPP framework to achieve better communication and more confidence in investors.

Comparative Analysis: Lessons from Global Models

It has been noted that renewable energy projects can be developed and financed through PPP. Malaysia, for example, has its own PPP framework, which requires further improvement, especially compared to international best practices. It would benefit Malaysia to study the enacted international legislations of the UK, Germany, and Japan as they may provide a framework for Malaysia to strengthen its PPP initiatives effectively.

Since introducing renewable energy, people have been looking forward to a new framework for managing market risks. It must be noted that whenever the market prices in the UK drop, the Government supports Renewable energy providers through the CfD. This has been one of the increasing offshore wind energy equipment expansions, as the UK enjoyed a record of 11 GW by 2022. This model is principally engaged in risk sharing and has, over the years, reduced uncertainty in the market. Perhaps if they were implemented into Malaysia's new plan, they could provide private investors with the support they have sought.

Germany exhibits best practice again through its Renewable Energy Sources Act (EEG), which encourages investments in renewable energy through guaranteed tariff levels and other innovative financing methods. These policies have enabled Germany to reach a target of 40% share of renewable energy in its energy mix by the year 2021. A salient feature of the EEG that is likely valuable for Ethiopia is its bottom-up orientation, in which local governments and private actors are encouraged to use renewable energy technologies actively. This includes India's active participation from stakeholders so that all regions can share the benefits. Germany's example is Malaysia's search for answers to how to encourage local involvement in the infrastructure of the renewable energy industry through decentralised policies.

In Japan, the main target of PPP projects was to encourage the creation of new technologies to utilise the latest renewable energy technologies. The Fukushima Floating Solar Plant comes to mind. This project is based on combining public funding with private R&D. This engagement helped develop solar technology and Japan's energy security and sustainability vision (Murshed & Hossain, 2020). Perhaps, turning its eyes to Japan, Malaysia could seek to design energy policies focusing on innovative R&D grants and fostering partnerships between public agencies and private companies to develop advanced renewable energy technologies.

Therefore, while Malaysia's PPP framework has created a platform for constructing renewable energy sources, it is evident that if Malaysia learnt from international best practices, the construction process could be dramatically improved. In light of these termination methods for contracts for energy performance and construction of infrastructure projects, Malaysia could integrate CfDs from Britain or other risk-sharing approaches through indirect decentralised participation, such as in the EEG in Germany and Japan-style PPP promotional strategies.

Role of PPPs in Achieving Energy Security and Sustainability

The partnership between private and public organisations helps Malaysia grow more sustainable and improve its energy security. PPPs help shift Malaysia towards energy independence, giving us alternatives to banish our reliance on fossil fuels and create stability in our energy supply. The Malaysian government has set a goal known as the Renewable

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 01-13
DOI: 10.35631/IJEMP.830001

Energy Target, wanting to generate 31% of its energy needs from green sources by 2025. The PPP model has been applied in building solar farms and biomass plants that help reach their targets (Mamat & Ibrahim, 2019).

The Kuala Lumpur Biomass Energy Project shows how PPPs handle environmental and energy issues at the same time. This project proved that PPP partnerships help make environments and people thrive by turning used palm oil waste into energy. The project produced clean energy and dealt with community waste issues in nature and human affairs (Puthucheary & Suryadi, 2021).

Despite the significant potential for renewably sourced energy via public-private partnerships in Malaysia, they have struggled due to several significant issues. The project struggles due to limited funding support, which makes companies unsure of what policies will stay, and investors do not know when they will get paid back. Current problems suggest we must strengthen PPP regulations and give ongoing backing from the government to achieve long-lasting success with clean energy goals. PPP projects help move Malaysia quickly towards cleaner energy sources. Malaysia can meet its renewable energy targets more effectively by letting different groups share duties and develop new ideas. Prioritising the solution to government issues is key to discovering how PPPs can best contribute to Malaysia's energy future.

Policy Recommendations

The people who developed Malaysia's Public-Private Partnership (PPP) system have suggested changes to make it work better for the renewable energy sector. The suggested steps are meant to fix today's problems, bring private industry more into government affairs, and ensure Malaysia's energy transformation happens smoothly. These fall under four main categories: We need to make financial offers better, fix rules and regulations faster, encourage technical growth, and adopt what works best around the world.

First is enhanced financial incentives. Renewable energy projects need financial support if private firms want to invest in them. Malaysia can lower investment risks and indirectly control energy costs through CfD risk-sharing plans. Promising payment to those who invest their money in renewable energy helps calm worries about unpredictable energy bills. Renewable energy projects should be given priority to make readily obtainable funding under the Green Finance Initiatives. Doing so may attract the private sector to invest in renewable energy projects.

The second is streamlined regulatory processes. Bureaucracies that are difficult to follow and contain many separate parts make it hard for private investors or companies to support renewable energy projects. A new regulatory body to handle all PPP tasks that focuses on resolving conflict when different state authorities struggle to step in will ensure fair project monitoring. This authority would guarantee that projects work like clockwork based on well-defined standards and equitable treatment throughout their development path. Making Malaysia more appealing to investors makes more people want to invest their money.

Third is the promotion of innovation. Public and private companies' successful growth of renewable energy requires innovative projects and support teams to work together. Supporting renewable energy tech through research money might help technology improve. Japan is a relevant and suitable example that shows how governmental support for research and

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 01-13
DOI: 10.35631/IJEMP.830001

development helps immensely in improving the companies' ability to develop new energy solutions and methods.

The final component is using the best examples and methods worldwide. Drawing lessons from developed countries' success in renewable energy can teach Malaysia how to improve their Public-Private Partnerships (PPPs). Also worth looking at are the legal and financial arrangements Germany, Japan, and the UK use. These countries succeed with PPPs because they have solid systems that ensure projects stay operational for a long time. Besides that, engaging in international partnerships is another step forward. By working together, these countries can advance faster towards a renewable energy system they can trust.

In conclusion, practical policy suggestions are achieved through inventive, financial, and regulatory methods and studies of worldwide best practices. The key to Malaysia developing a stronger renewable energy sector is to provide better financial incentives, reduce regulatory procedures, encourage innovation, and incorporate proven ideas from other countries or nations.

Methodology

Using a methodical method such as the doctrinal analysis, the social, legal, economic and regulatory structures surrounding public-private partnerships in Malaysia's renewable energy sector have been scoured. Such a method encompasses the analysis of legal provisions, applicable case law, regulatory frameworks, and international agreements to determine how effective the PPPs are in sustainability in energy infrastructure development.

Legal instruments such as USM's Renewable Energy Act of 2011, Malaysia's federal constitution, the Public-Private Partnership Handbook of Malaysia, IRENA reports, World Bank publications, and other international texts are considered within Malaysian Law as a normative model. These legal sources are embedded in the country's energy transition and international practices.

In order to deepen our analysis, we will also consider the comparative approaches of already established PPP practices in the United Kingdom, Germany, and Japan. By considering Malaysia's PPP measures against these global models, this research outlines issues concerning financial incentives, risk-sharing arrangements and policies. It provides a final set of recommendations that are more appropriate to the Malaysian context.

Guided by the doctrinal method, this approach systematically and thoroughly examines how PPP-initiated renewable energy projects can moderate or mitigate high capital costs, technological and regulatory risks, and uncertainties. The framework offers guidance in implementing policy and legal changes necessary for Malaysia to progress towards a low-carbon economy and meet sustainable energy objectives.

Findings

The Need for a Clearer Legal Framework for PPPs in Renewable Energy

The legal system in Malaysia needs better development in public-private partnerships for renewable energy projects because they remain insufficiently developed across various parts of the sector. Though Malaysia now has a Renewable Energy policy to guide the sector, the nation still needs distinct laws governing private-public partnerships in renewable energy

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 01-13
DOI: 10.35631/IJEMP.830001

projects. Although the Malaysia National Energy Policy 2022-2040 (DTN) was launched by Economic Planning Unit Prime Minister's Department on 19 December 2022 did highlight effective, targeted and cost-effective investment in energy infrastructure, through well-designed public-private partnership models ((EPU), 2022), but it still lack of clarity on which guidelines and indicators model that suitable to be used for renewable energy. This indistinctly furthered echo in the recent policy of Public-Private Partnership Master Plan 2030 (PIKAS 2030) where, although the government did introduce the elements of implementation of sustainability in its PPP project in any replacement work or upgrade works for long-term management contracts such as waste management, energy and water usage, and biodiversity conservation ((UKAS), 2022), this however remain unclear on how this master plan shall be executed on sustainable energy project and infrastructure. The lack of appropriate rules damages investors' trust and hinders regulatory oversight, which hurts project delivery results. According to Tan (2023), the public and private sectors require an enforceable framework to improve transparency and financial partnership management in PPPs. When Malaysia lacks a clear framework for renewable energy projects, it could stop important investments and slow its progress in renewable energy.

Challenges in Financing and Risk Allocation

Finding funding partners and sharing project risks create significant challenges for renewable energy public-private partnerships in Malaysia. Private investors avoid renewable energy investments because of enormous upfront spending while facing unknown future regulations. The International Renewable Energy Agency (IRENA, 2021) reports that effective renewable energy private investment requires countries to establish strong financial support by offering PPAs, subsidies, and tax benefits for extended periods. Malaysia uses outdated government-backed risk-sharing models that cannot protect investors from energy market shifts or technology unpredictability. Properly dividing risk-sharing responsibilities between the public and private sectors is essential to making renewable energy projects successful financially.

Comparative Analysis of Global Models

Many other nations, including the UK, Germany and Japan, rely on bigger Public-Private Partnership setups to foster renewable energy projects. Through the CfD scheme, the UK Department for Business, Energy & Industrial Strategy (2020) secures capital investment for renewable projects by providing fixed-rate contracts to private investors. Through its Feed-in Tariff system, Germany encourages renewable power investments by paying fixed amounts to projects that generate electricity from renewable resources. These worldwide systems prove that steady renewable energy policies help bring in investments while building reliable renewable energy markets.

Regulatory and Institutional Challenges

Effective institutional coordination and simplified regulations are needed to help Malaysia succeed with its renewable energy projects despite the advantages of PPPs. Different parties, such as public institutions, state companies and private investors, make decisions that create unplanned delays and misunderstandings. Malaysia's underdeveloped renewable energy regulations do not align with modern international standards, making project development more challenging. Currently, this sustainable energy being monitored, enforced and implemented by several ministries and its agencies bodies like the Ministry of Natural Resources and Environmental Sustainability ("NRES"), Ministry of Economy, Energy Commission ("EC") and Sustainable Energy Development Authority ("SEDA"). According to Harun and Idris (2020), the regulatory uncertainty between the EC and SEDA arises from their

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 01-13
DOI: 10.35631/IJEMP.830001

overlapping responsibilities. While the planning and implementation of any PPP project is being held on the UKAS. As mentioned earlier, there is not clear and specific on what kind of PPP's model that can be used to support sustainable energy project and infrastructure as each of the PPP's project is vary from one to another, and sustainable energy project and infrastructure is one among it To make the most of PPPs, Malaysia must create a unified system where all parties stand united with clearly shared objectives.

The Importance of Innovative Financial Mechanisms

To find new ways to bring money into renewable energy partnerships, Malaysia should look at financial strategies other nations have used successfully. Since Japan and Germany now use green bonds, they have proven an excellent way to fund renewable energy projects. Green bonds that target sustainability projects draw investor interest and can supply more funding to Malaysia's renewable energy sector, according to IRENA 2021 data. The government and private investors working together through a renewable energy investment fund helps reduce financial risks owners experience in their extended infrastructure projects. New ways to fund renewable energy projects and flexible public-private partnership terms will better attract private sector investment into Malaysia's energy transformation.

The Role of Public-Private Partnerships in Promoting Technological Innovation

The results of our research show that Malaysia's PPP system could lead to the development of new renewable energy technology. PPPs let private and public partners work together to make and use advanced renewable energy technology. The public sector partners with private companies to bring new technologies to renewable energy programs by ensuring these solutions match government energy goals. Technology innovation in renewable energy allows countries to develop their market, according to Chong (2022), who describes success in the Japanese solar industry and German energy storage policies. By promoting innovation through public-private partnerships, Malaysia can move faster toward renewable power while building its local green technology sector as an economic driver.

Environmental and Social Impacts of Renewable Energy PPPs

Through public-private partnerships in renewable power, we can deal with both environmental and social problems while reaching business goals. Using renewable energy projects helps decrease pollution and delivers electricity to people in rural areas while providing local work opportunities. These projects bring environmental and social dangers that include property conflict, harm to natural life, and opposition from people whose daily lives are impacted. According to World Bank data from 2020, successful PPP models require thorough evaluations of social and environmental impact to ensure that projects benefit people and communities. Social responsibility rules in Malaysia's PPP renewable energy contracts encourage people to return to these projects and support their long-term growth.

The Need for Capacity Building in the Public Sector

Malaysia needs to better train its public sector employees on running renewable energy projects with private companies. Success in renewable energy public-private initiatives depends on good working relationships between government, public organisations, and private companies. The government must enhance its financial and technical expertise to handle renewable energy Public-Private Partnerships right. Due to a lack of unique skills and know-how, the Malaysian administration struggles to oversee complex PPP projects. The Asian Development Bank (2021) stated that governments should teach employees better skills to manage PPP projects

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 01-13
DOI: 10.35631/IJEMP.830001

correctly. To help these programs maintain success over time, Malaysia should teach its public servants who manage renewable energy regulation to run things correctly.

Incentivizing Private Sector Participation through Risk Mitigation Tools

Finally, the private sector will take greater interest in renewable energy projects when Malaysia adopts government-backed loan programs alongside insurance schemes to reduce project risks. These safety measures help investors reduce their worries about renewable energy project risks, especially market fluctuations, equipment problems and government policy shifts. These methods attract private funding for renewable energy projects when governments, including Spain and South Korea, support them with insurance and banking. Malaysia should adopt risk-reducing financial products to bring private investors into the renewable energy sector.

Recommendation

To improve the PPP strategies, Malaysia needs to follow the global standards in renewable energy development to improve its results. Improving the rules and legislation that control PPPs serves as our first recommendation. Malaysia should adopt UK PPP practices as their model because their clear legal framework guarantees responsible project delivery for both public and private sector parties. Malaysia would convert its present energy policies into formal agreements to outline how public and private sector partners in renewable projects should behave (Goh, 2023). Long-term investments depend on clear market rules, which makes stable investment conditions important for private investors.

It is also benefited that the governance and administration of these ministries and its agencies being coordinated and uniformed effectively in delivering, executing and implementing PPPs on sustainable energy infrastructure. Multiple orders and execution of these policies from top lead to confusion and ambiguity to the industry players. The energy governance structure needs to have a clear line of authority. The enhanced energy governance structure is expected to strengthen monitoring and overall energy sector growth. With the establishment of National Energy Council under the DTN will steer and guide energy sector strategic decisions ((EPU), 2022). The council will be chaired by the Prime Minister, to be represented by all ministries and agencies related to energy sector with Economic Planning Unit, Prime Minister's Department (EPU) being the Secretariat, is hopefully can foster this initiative through PPPs.

Malaysia must create benefits that draw private companies into high-danger renewable energy projects. As Germany has demonstrated, the government can support renewable development through tax breaks matched by interest rate discounts and project backings to safeguard investment returns. These financial benefits will motivate private financiers to start major renewable energy ventures when the projects stay profitable (Chong, 2022). Special funds for clean energy will help all companies grow in Malaysia's sustainable shift.

Another recommendation is that organisations should adequately train public agencies to manage renewable energy Public-Private Partnerships. Malaysia should use public funds to train personnel who execute energy policies and manage power projects. Specialised training programs about renewable energy projects plus financing would help public officials understand PPP requirements better. The Asian Development Bank (2021) states that capacity building helps public agencies effectively check and enforce PPP project guidelines.

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 01-13
DOI: 10.35631/IJEMP.830001

Additionally, Malaysia should widen its environmental and social impact assessment procedures to run environmentally friendly and socially friendly renewable energy projects. Renewable energy projects must pass the World Bank's (2020) impact assessment process, which mandates community consultation for all renewable projects. These steps will help evaluate the project's effects on people and nature, lowering conflicts and guaranteeing successful operation.

Lastly, Malaysia should set up a facility that promotes innovation and commercialisation to support the progress of renewable energy technology. Like Japan, Malaysia needs partnerships between public research groups, universities and education services, private companies, and startup firms to help create better renewable energy solutions faster. The country should provide financial and technical support through grants and incentives for adopting renewable energy technology to keep its global power generation market position.

Conclusion

In conclusion, Malaysia needs strategic reforms to improve how it brings renewable energy projects together through public-private partnerships. Malaysia can create more efficient systems to bring private funding alongside renewable energy growth through a better framework that combines international PPP models. Renewable energy sector development requires improving legal rules, giving private investors tax breaks and regulatory support, helping public agencies work better, performing full reviews of potential impacts, and backing new technology creation. Thus, this study would like to recommend extensive and further improved and amended policies according to the current issues faced in PPP will guide Malaysia to a cleaner economy by matching global standards and making the country an energy innovation pioneer in PPP. The new regulations, policy and guidelines will lead to an energy market balance that adapts to worldwide changes alongside sustainable development. This study recognizes the importance of PPP as pivotal instruments to accelerates Malaysia's transition towards sustainable energy in future. This study has contributed by rigorously identifies and critiques critical legal, financial, and regulatory shortcomings, demonstrating how these structural weaknesses hinder renewable energy development in Malaysia.

Acknowledgement

This publication is the outcome of a collaborative group project undertaken by research associates of the Energy Law course at the Faculty of Law, Universiti Teknologi MARA, Malaysia. The authors gratefully acknowledge the collective effort, research contributions, and dedication of all members involved in the project. Special appreciation is extended to the Faculty of Law, UiTM, for its generous support and sponsorship of this publication, which has made the dissemination of this work possible.

References

Abdullah, N., & Zain, R. (2018). Renewable energy investment strategies under Public-Private Partnerships. *Journal of Energy Policy, 45*(3), 123–135.

Ali, S., & Ahmad, T. (2021). Financial risk management in renewable energy PPPs. *Asian Journal of Renewable Energy Studies, 6*(2), 77–89.

Asian Development Bank. (2021). *Building capacity for public-private partnerships in renewable energy projects*. ADB Publications.

Chong, W. (2022). The role of technological innovation in renewable energy partnerships. *International Journal of Renewable Energy, 15*(2), 98-111.

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 01-13
DOI: 10.35631/IJEMP.830001

Federal Ministry of Labour and Social Affairs. (2023). *Protection Against Dismissal Act*. Germany: Federal Ministry of Labour and Social Affairs.

Ghosh, A. (2021). Comparative analysis of PPP frameworks in renewable energy: Lessons from the UK, Germany, and Japan. *Global Energy Review, 12*(1), 45–67.

Goh, M. (2023). Enhancing the legal framework for public-private partnerships in Malaysia. *Journal of Energy Law, 18*(1), 55-67.

Harun, A., & Idris, I. (2020). Renewable energy policy development in Malaysia: An overview of regulatory frameworks. *International Journal of Energy Economics and Policy, 10*(4), 123-134.

Hohendanner, C., Müller, T., & Weber, E. (2022). The impact of reskilling programs on workforce re-entry: Evidence from Germany. *Labour Market Research Journal, 54*(3), 245–260.

International Labour Organization. (2017). *Employment promotion and protection against unemployment convention*. Retrieved from https://www.ilo.org/

International Renewable Energy Agency (IRENA). (2021). *Renewable Energy Financing: A Global Perspective*. IRENA.

Japanese Ministry of Health, Labour, and Welfare. (2022). *Labour court cases and employment adjustment subsidy report*. Japan: Ministry of Health, Labour, and Welfare.

Kamaruzzaman, A., & Mustaffa, M. (2022). Enhancing financial models for renewable energy projects in Malaysia. *Renewable Energy Policy Journal, 8*(4), 233–247.

Khan, M., & Khalid, F. (2021). Legal and regulatory aspects of PPPs in sustainable energy. *Journal of Public Sector Law, 15*(2), 98–112.

Mamat, R., & Ibrahim, Z. (2019). The impact of PPPs on Malaysia's renewable energy infrastructure. *Energy Transition Journal, 7*(1), 56–69.

Ministry of Manpower. (2023). *Tripartite advisory on managing excess manpower*. Singapore: Ministry of Manpower. Retrieved from https://www.mom.gov.sg/

Murshed, M., & Hossain, M. (2020). Public-private partnerships in fostering innovation in renewable energy. *International Journal of Energy Studies, 14*(3), 120–132.

Noor, A., & Zainal, M. (2018). Challenges and opportunities in PPPs for renewable energy development. *Malaysian Renewable Energy Journal, 5*(2), 112–128.

Murugiah, P. (2022). *Private Finance Initiative (PFI): The search for accountability* [Report]. Centre to Combat Corruption and Cronyism (C4 Center).

Puthucheary, M., & Suryadi, K. (2021). Comparative insights on renewable energy PPPs: A focus on Malaysia, Germany, and Japan. *Asian Policy Insights, 9*(2), 99–119.

Rashid, S., & Husni, A. (2019). Regulatory frameworks in PPP-driven renewable energy projects. *Energy Policy and Governance Review, 11*(3), 75–90.

Rashidi, N. A., Chai, Y. H., & Yusup, S. (2022). Biomass Energy in Malaysia: Current Scenario, Policies, and Implementation Challenges. *BioEnergy Research*, *15*(3), 1371-1386.

Shafie, A., & Othman, Z. (2019). A study on legal frameworks supporting renewable energy in Malaysia. *Journal of Malaysian Environmental Law, 10*(4), 321–334.

Tan, S. (2023). Legal frameworks for renewable energy: The need for reform in Malaysia's PPP models. *Malaysian Law Journal, 27*(2), 45-67.

UK Department for Business, Energy & Industrial Strategy. (2020). *Contract for Difference: A guide for applicants*. Retrieved from https://www.gov.uk

UK Government's Department for Business, Energy & Industrial Strategy. (2023). *Employment Rights Act 1996: Structured redundancy processes*. United Kingdom: UK Government. Retrieved from https://www.gov.uk

International Journal of Entrepreneurship and Management Practices
IJEMP
EISSN : 2600-8750
Volume 8 Issue 30 (June 2025) PP. 01-13
DOI: 10.35631/IJEMP.830001

Widyastuti, E., & Wicaksono, R. (2020). PPPs in overcoming financial and technological barriers in renewable energy. *International Energy Development Journal, 19*(2), 98–113.

World Bank. (2020). *Environmental and social impacts of renewable energy projects in developing countries*. World Bank Group.

World Bank. (2022). Renewable Energy Development Project - Phase 2 (P509365) World Bank.