STIESIA
ICOBUSS
e-ISSN 2746-5667
5th INTERNATIONAL CONFERENCE ON BUSINESS & SOCIAL SCIENCES
RESPONSIBLE AI AND HUMAN-CENTERED DESIGN: BRIDGING ETHICS AND INNOVATION

STRATEGIC MANAGEMENT OF MARITIME HUMAN RESOURCES TO SUPPORT SUSTAINABLE OCEAN ENERGY TRANSITION

Wisnu Ramdhani[1], Sigit Purwanto [2],
[1,2]Doctoral Student of Management Science Program, Indonesian College of Economics, Surabaya, Indonesia

Corresponding author:wisnuramdhanimaulana2019@gmail.com, Sigit.Purwanto@poltekpel-Sby.ac.id

Abstract. The energy transition in Indonesia faces critical challenges not only in terms of technology but also in the readiness of human resources (HR) as strategic actors. Despite Indonesia's vast potential in marine and solar energy, research on the integration of wave energy converters (WEC) and floatovoltaics remains limited, particularly from a human resource management perspective. This gap highlights the lack of studies addressing how competency development, coastal community empowerment, and adaptive leadership can support a just and sustainable transition to a Blue Economy-based economy. This study aims to develop a strategic HR management model that enhances local energy resilience and promotes socio-economic justice. An exploratory case study was conducted in Niyama Beach, Tulungagung, using a qualitative approach through in-depth interviews, field observations, and document analysis. The findings reveal a significant skills gap in operating hybrid marine energy technologies, the absence of long-term training and certification programs, and limited community participation in decision-making. Nevertheless, opportunities exist in combining traditional local knowledge with formal training to build a competitive advantage. The study concludes that a successful transition requires an inclusive HR management model emphasizing competency development, transformative leadership, community empowerment, and the integration of Blue Economy principles into national energy policy.

Keywords : Human Resource Management, Energy Transition, Blue Economy, Hybrid Marine Energy, Coastal Empowerment

1. Introduction

This research is based on the realization that strategic human resource management, energy transition, the Blue Economy, hybrid marine energy, and coastal community empowerment, as well as green job creation, are key interrelated concepts in achieving sustainable development. The world is currently facing global challenges, including climate change, decarbonization, and Net Zero Emissions targets, which demand the acceleration of the energy transition. At the same time, Indonesia, as an archipelagic country with a coastline of over 108,000 km, has enormous marine and solar renewable energy potential. However, its utilization remains low due to limitations in technology, infrastructure, and, especially, the capacity of human resources (HR). On the other hand, Indonesian coastal areas also still face the problem of limited decent employment opportunities for local communities, most of whom depend on the traditional fisheries sector for their livelihoods, with fluctuating and vulnerable incomes.

This condition creates fundamental problems in the form of a skills gap in mastering hybrid marine energy technology, the lack of a strategic human resource management framework that links technical competencies with the socio-economic empowerment of coastal communities, limited site-specific modeling research, and low local community involvement in decision-making that has implications for social resistance and project sustainability. Therefore, this study focuses on a case study of the implementation of hybrid marine energy, specifically wave energy converters and floatovoltaics, at Niyama Beach, Tulungagung, with an emphasis on human resource development strategies, adaptive leadership, community empowerment, and the integration of energy policies with the Blue Economy vision.

Indonesia, as a maritime nation with the second-longest coastline in the world, has significant potential for developing marine energy sources, including wave energy, tidal energy, offshore wind energy, and marine thermal energy. This potential is highly relevant to the Blue Economy concept, which emphasizes the sustainable use of marine resources to support economic growth while preserving ecosystems. However, marine energy development still faces several obstacles, ranging from technological limitations to immature regulations and suboptimal human resource quality.

In this context, Strategic Human Resource Management (SHRM) is a crucial approach to addressing the challenges of developing a blue economy-based marine energy sector. Strategic Human Resource Management views human resources not only as a factor of production but also as a strategic asset that must be managed in an integrated manner with the organization's overall strategy. Integrating human resource practices (recruitment, training, performance management, compensation, and organizational culture) with marine energy development strategies will strengthen the competitiveness of Indonesia's maritime sector.

Previous literature reviews have shown that Strategic HRM theory (Wright & McMahan, 1992) emphasizes the importance of alignment between human resource policies and organizational strategy, while the Resource-Based View theory (Barney, 1991) asserts that competitive advantage arises from unique and difficult-to-imitate resources, including the local knowledge of coastal communities. Furthermore, theory (Rogers, 2003) highlights that perceived benefits, compatibility, and complexity strongly influence technology adoption. From a just energy transition perspective, the concept (Heffron & McCauley, 2017) emphasizes the importance of equitable benefit distribution, community participation in decision-making, and recognition of local cultural identity. Meanwhile, the Blue Economy concept (Pauli, 2010) emphasizes the sustainable use of marine resources to create economic, social, and ecological value. However, most research still focuses on the technical aspects of marine energy, thus lacking a link to employment issues in coastal areas, even though the energy transition actually opens up opportunities for new job creation, both as technicians, operators, and micro-entrepreneurs based on clean energy. Studies on the integration of the technical aspects of marine energy with human resource management in Indonesia are still limited, with most research focusing primarily on the technical dimensions or general policies, without in-depth consideration of the managerial, social, and empowerment aspects of coastal communities, who are the leading actors in the energy transition.

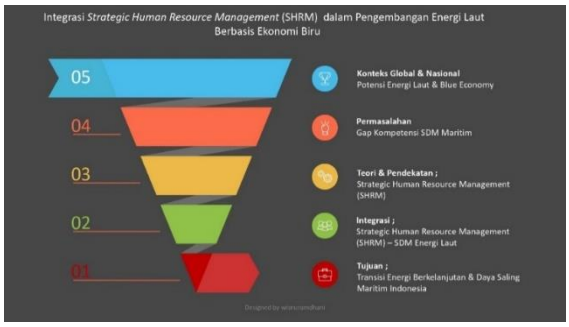
To date, research on marine energy development in Indonesia has primarily focused on technological and policy aspects, while strategic human resource management remains underdeveloped. Yet, maritime workforce competency, organizational leadership, and talent development strategies are key factors in realizing a sustainable energy transition. Therefore, it is crucial to examine how SHRM can be integrated with marine energy development strategies within a blue economy framework.

Based on this, the urgency of this research is to formulate an inclusive, adaptive, and participatory human resource management model to bridge the gap between the potential of hybrid marine energy technology and the reality of socio-economic implementation in the field, including addressing the challenge of limited employment opportunities in coastal areas through the creation of green jobs. Based on this description, the main problems of this research can be formulated including: (1) how prepared are coastal human resources to support hybrid marine energy, (2) how can human resource management strategies reduce the skills gap and increase community involvement, (3) what kind of management model is relevant to support the Blue Economy-based energy transition, and (4) What is the contribution of SHRM integration to achieving sustainable development goals (SDGs) in the maritime sector. To

answer these problems, this research focuses on the following research questions ; (1) To what extent can SHRM integration support the strengthening of maritime human resource competencies in the development of marine energy based on the blue economy, (2) What factors are the key to the success of SHRM implementation in the Indonesian marine energy sector, (3) What are the conceptual and practical implications of SHRM implementation for strengthening Indonesia's maritime energy competitiveness in the energy transition era. The results of this study are expected to identify human resource competency gaps, formulate training and certification-based development strategies, and produce inclusive, adaptive, and participatory management models. In addition to making academic contributions to the coastal energy management literature, this study is also expected to provide practical support for national energy transition policies within the framework of the blue economy.

This study aims to examine the relationship between SHRM and the development of a blue economy-based marine energy sector in Indonesia. By highlighting the role of strategic human resources, this article aims to make conceptual and practical contributions to enhancing Indonesia's maritime competitiveness and supporting the achievement of sustainable development.

Figure 1. Integration of Strategic Human Resource Management (SHRM) in the Development of Blue Economy-Based Marine Energy



2. Literature Review

Strategic Human Resource Management (SHRM).

According to Wright and McMahan (1992), strategic human resource management is understood as the process of aligning workforce management policies and practices with the organization's strategic direction, thereby supporting sustainable excellence. In the context of the energy transition, this approach entails workforce planning, competency development, and change management that are aligned with the transition to clean energy. Human resources are no longer viewed merely as technical implementers, but as key drivers determining the organization's success in adapting to external dynamics, including the transition to renewable energy.

Teori Resource-Based View (RBV)

Barney (1991) emphasized that sustainable competitive advantage can only be achieved when an organization possesses resources that are highly valuable, rare, difficult to imitate, and not easily replaced by alternatives. Human resources are one such strategic asset. In hybrid marine energy projects, local knowledge of coastal communities about water conditions and traditional skills can be combined with modern technology, resulting in advantages that competitors do not possess. Thus, human resource management in the energy transition needs to emphasize the synergy between local wisdom and technological innovation.

Diffusion of Innovation

Rogers (2003) explains that perceived benefits, suitability to user conditions, technological complexity, trial opportunities, and visibility of implementation results determine the innovation adoption process. In hybrid marine energy applications, the readiness of human resources to accept and operate new technologies is a key determinant of transition acceleration. Without adequate understanding and skills, technology risks being rejected or underutilized by coastal communities.

Just Energy Transition (Heffron & McCauley, 2017).

Heffron and McCauley (2017) proposed the concept of a Just Energy Transition, which emphasizes equitable distribution of energy benefits, community involvement in decision-making, and respect for local identity and culture. In the context of coastal Indonesia, this means that communities should not only be positioned as technical workers, but also as stakeholders in the planning, management, and economic beneficiaries of hybrid marine energy projects.

Blue Economy (Pauli, 2010).

Pauli (2010) describes the Blue Economy as a development approach that harnesses the potential of marine resources sustainably, to create added value in economic, social, and environmental terms. From an energy perspective, the Blue Economy encourages the development of marine technology not only as a provider of electricity, but also as a driver of local economic growth through job creation, business diversification, and protection of marine ecosystems. This concept serves as the basic framework for research because it connects energy aspects with the development of sustainable coastal communities.

Previous Research

Previous studies have emphasized the importance of energy diversification and community engagement. Kumar and Managi (2009), for example, found that energy projects in developing countries are at risk of failure if the role of local labor is neglected. A study by Ocean Energy Scotland (2019) demonstrated the success of community-based marine energy programs through community involvement in environmental monitoring and asset management.

In Indonesia, most research still focuses on technical aspects. For example, studies on wave energy converters at Baron Beach (Wijaya & Wayan, 2010; Sona & Purwono, 2014) and floating PV systems in Cirata Reservoir (Fatima & Qureshi, 2021) were conducted separately, without integration into a single hybrid model. Recent research at the global level also emphasizes the importance of integrating renewable energy systems. Wang et al. (2024) conducted a literature review on hybridizing solar, wind, and wave energy, while Rezaei et al. (2022) examined hybrid systems for coastal areas from technical, economic, and environmental perspectives. However, very little research links human resource management and community empowerment to hybrid marine energy development, particularly in tropical regions.

Based on the above study, it is concluded that there are research gaps as follows; 1) The lack of studies on the integration of floating PV-WEC in tropical regions such as Indonesia, 2) The lack of application of a strategic human resource management framework in the planning and implementation of marine energy projects, 3) The limitations of specific location-based data, because most studies still rely on general wave and solar radiation data, 4) The lack of socio-economic impact analysis, including job creation and empowerment of coastal communities. Therefore, this study attempts to fill these gaps by proposing a strategic human resource management model that supports the integration of hybrid marine energy based on the Blue Economy, through a case study at Niyama Beach, Tulungagung.

Based on the theoretical study and previous research, a conceptual research model was prepared as shown in Figure 2:

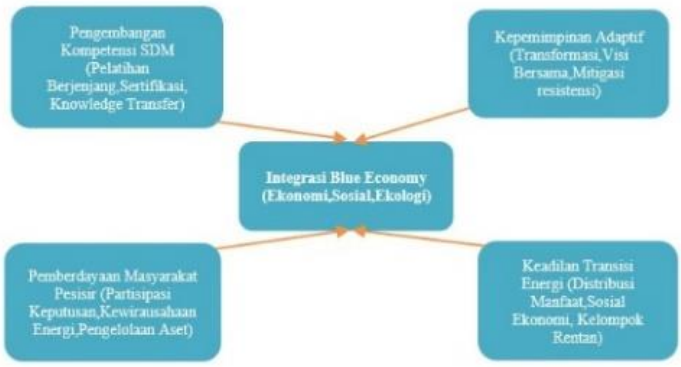


Figure 2. Conceptual Model of Strategic Human Resource Management Based on Blue Economy

After outlining the relevant key theories and presenting the conceptual model in Figure 1, this study then develops a more operational conceptual framework. This framework aims to clarify how each key component in the conceptual model translates into analytical indicators and their strategic implications in the context of Blue Economy-based human resource management.

This conceptual framework also serves as an analytical guide, enabling a systematic understanding of the relationships between theories, variables, and the research context. Thus, the following table not only demonstrates the interrelationships between concepts but also provides a practical overview of the direction of the expected findings from this research.

Based on the conceptual model, the conceptual framework of the research can be formulated as shown in the following table;

Table 1: Framework Konseptual.

Component	Indicator	Implications
Human resource competency development	Multi-level training, certification, and knowledge transfer	Improving the technical and managerial competencies of coastal human resources
Adaptive Leadership	Shared vision, organizational transformation, resistance mitigation	Building motivation, support, and sustainability of energy organizations
Coastal Community Empowerment	Participation in decisions, energy entrepreneurship, and asset management	Transforming communities from beneficiaries to key actors in the energy transition
Energy Transition Justice	Fair distribution of benefits, protection of vulnerable groups, and social justice	Ensuring an inclusive and just energy transition
Blue Economy Integration	Ocean-based economic, social, and ecological values	Creating sustainable coastal economic growth based on marine energy

3. Research Methods

Research Design

This research employs a qualitative approach. It explores stakeholder perspectives, including human resource readiness and challenges in the hybrid ocean energy transition. This design

was chosen based on the need to address research gaps that are not only technical but also involve managerial, social, and policy aspects.

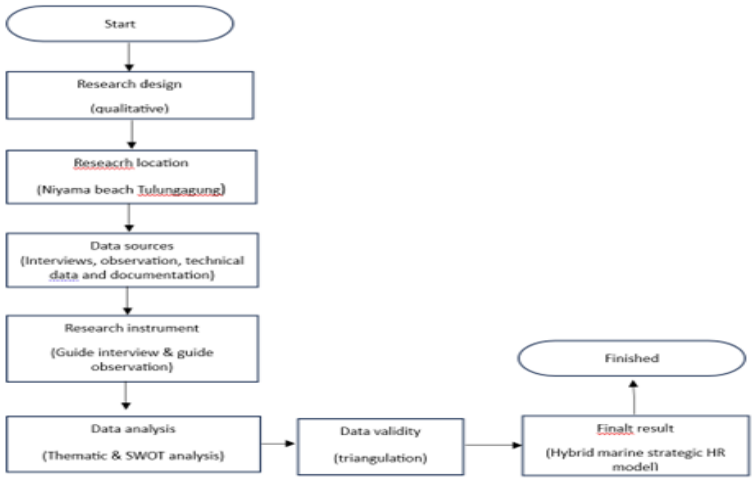


Figure 3. Research Method Flow Concept

Research Location

The research was conducted at Niyama Beach, Tulungagung Regency, East Java. This location was chosen because of its significant marine energy potential and proximity to a hydroelectric power plant (PLTA) project. This location also represents Indonesia's coastal areas, which face the dual challenges of abundant renewable energy sources but low utilization rates, as well as limited employment opportunities, necessitating the empowerment of local communities.

Data source

1. **Primary Data**
   a) In-depth interviews were conducted with 15 key informants, including representatives from local governments, academics, energy practitioners, and coastal communities. Informants were selected using purposive sampling based on their direct involvement in energy issues or coastal management.
   b) Field observations were conducted to map infrastructure conditions, energy access, and the potential for implementing wave energy converter (WEC) and floatovoltaic technology.
2. **Secondary Data**
   a) Technical data: solar radiation intensity, wave characteristics, and electrical data were obtained from the Meteorology, Climatology, and Geophysics Agency (BMKG) and PLN.
   b) Policy documents: National Energy General Plan (RUEN), East Java Regional Energy General Plan (RUED), and national energy transition report.
   c) Scientific publications and international reports related to marine energy development, human resource management, and the Blue Economy.

Research Instruments

a) The interview guide was prepared with reference to the theories of Strategic HRM, Resource-Based View, and Just Energy Transition, covering aspects of technical competence, adaptive leadership, fair distribution of benefits, and community empowerment.

b) Observation sheets are used to record the physical condition of energy infrastructure and community interactions with technology.

Data Analysis Techniques

Data from interviews and observations were analyzed using thematic analysis techniques, grouping findings according to theoretical categories: Strategic HRM, RBV, Diffusion of Innovation, Just Energy Transition, and Blue Economy. The analysis results were used to understand human resource management patterns, social resistance, and opportunities for community empowerment.

Thematic analysis is a qualitative data analysis method that aims to identify, analyze, and report emerging patterns (themes) within the data. This technique not only describes the data but also interprets various aspects of the research topic. According to Braun and Clarke (2006), thematic analysis is a method for identifying, analyzing, and reporting themes in data.

Data Validation

To ensure the validity of the data, this study uses:

a) Triangulation of sources (primary data from interviews, questionnaires, observations; secondary data from official documents).
b) Expert judgment, involving two renewable energy experts and one human resource management expert, was used to assess the research instruments and interpret the results.

Research Limitations

This research is limited to a single case study location, so the results cannot be generalized to all coastal areas in Indonesia. Furthermore, the financial aspects of hybrid energy projects are not the primary focus, but rather the interrelationships between human resource management, socioeconomics, and sustainability within the framework of the Blue Economy.

4. Results And Discussion

Human resources Profile in the Hybrid Ocean Energy Project in Tulungagung

Data collection results indicate that human resources in the coastal area of Tulungagung still face limited technical competency in operating hybrid marine energy technologies, both wave energy converters and float-voltaics. Most local workers possess basic electrical and mechanical skills but have not received explicit training in marine energy technologies. This aligns with a 2023 report from the Ministry of Energy and Mineral Resources (ESDM), which emphasized a skills gap in the renewable energy sector. Nevertheless, the potential of local human resources remains substantial, as coastal communities possess traditional experience in interpreting ocean conditions, which can become a strategic asset when combined with formal training.

These findings confirm Wright & McMahan's (1992) view that human resources are a strategic asset that determines an organization's success in adapting to external change. In the Tulungagung context, competency limitations can be overcome with a human resource management strategy that integrates technical training, certification, and community-based knowledge management programs.

Human Resource Competency Development Strategy

Field data analysis indicates that human resource competency development is being implemented through basic solar energy training programs, electrical technician training, and marine technology adaptation workshops. However, these programs are still short-term and not

yet integrated into long-term development plans. This creates a gap with actual needs on the ground, where the sustainability of marine energy projects requires a workforce with specialized skills that meet international standards.

These results reinforce the IRENA study (2022), which emphasized the importance of skilled workforce readiness for the effective global energy transition. Therefore, human resource development strategies in Tulungagung should be directed toward a tiered training curriculum, marine energy competency certification, and knowledge sharing among academics, the government, and coastal communities.

The Role of Leadership and Human Resource Policy

Interviews revealed that support from local governments and state-owned energy companies is still limited to the technical aspects of projects. At the same time, human resource development has not been a top priority. Adaptive leadership within energy organizations is crucial for building motivation, reducing resistance to innovation, and fostering local community involvement. Without transformative leadership, the implementation of marine energy technology tends to be stuck in a top-down pattern with minimal participation.

This aligns with the findings of Kumar & Managi (2009), who emphasized the importance of local community involvement in energy diversification in developing countries. Effective leadership must be able to integrate national energy policies with local coastal dynamics to ensure the sustainability of projects.

Coastal Community Empowerment

Observations show that coastal community involvement in marine energy projects is still limited to technical staff in the early stages of implementation. Participation in decision-making and post-implementation management is relatively low. This poses a risk of a low sense of ownership in the project. However, the experience of Ocean Energy Scotland (2019) demonstrates that community involvement in monitoring and managing energy assets enhances project success and sustainability.

Referring to the Just Energy Transition concept (Heffron & McCauley, 2017), empowering coastal communities involves not only technical training but also energy entrepreneurship, asset management, and participation in local policy forums. In this way, coastal communities can transform from beneficiaries to key drivers of the energy transition.

Human resource Management Model for Sustainable Ocean Energy Transition

Based on the research findings, a HUMAN RESOURCE management model can be formulated that supports a sustainable marine energy transition in Tulungagung. This model emphasizes synergy between:

1. Technical competency development through training, certification, and *knowledge transfer*.
2. Adaptive leadership to build a shared vision and reduce social resistance.
3. Empowering coastal communities by positioning them as active actors, not just technical implementers.
4. Energy transition justice through equitable distribution of economic and social benefits.
5. Blue economy integration makes marine energy a key component of sustainable development, encompassing ecological, social, and economic aspects.

With this model, the Blue Economy-based energy transition is expected not only to create local energy security but also to improve the welfare of coastal communities sustainably.

Case Study Context in Indonesia

Indonesia is an archipelagic nation with a coastline of over 108,000 km, making it one of the countries with the most significant marine energy potential in the world. According to data from the Ministry of Energy and Mineral Resources (2023), Indonesia's wave energy potential is estimated to reach 17.9 GW, while solar energy, including through float-voltaic systems, exceeds 200 GWp. However, utilization remains very low, at less than 1% of the total potential. One of the main obstacles is the limited human resource capacity to master marine energy technology.

In this context, coastal areas such as Tulungagung, East Java, hold a strategic position. Niyama Beach, the location of this research case study, has relatively stable ocean waves and high solar radiation potential. These conditions support the development of a hybrid marine energy system (wave energy converter + floatovoltaic). Furthermore, Tulungagung was chosen because fishing communities dominate its coastal area, thus providing significant opportunities for socio-economic empowerment through renewable energy projects.

However, observations indicate that coastal communities in Tulungagung still face challenges in human resource competency. Most workers are unfamiliar with modern marine energy technology, and training is limited. This aligns with the IRENA (2022) report, which emphasized a global skills gap in the energy transition. Therefore, the success of the hybrid marine energy project in Tulungagung depends heavily on a human resource management strategy that emphasizes not only technical aspects but also social aspects and community empowerment.

This case study also reflects a common gap in Indonesia. Despite commitments to an energy transition through the 2060 Net Zero Emissions target and the implementation of the Just Energy Transition Partnership (JETP) principles, implementation at the local level still faces obstacles. These obstacles include a lack of skilled labor, minimal community involvement in decision-making processes, and inadequate integration between central policies and regional needs.

Thus, the Tulungagung case study provides a clear illustration that the energy transition cannot focus solely on technological aspects. Coastal human resources must be the leading actors in supporting the successful integration of hybrid marine energy. With this model, the Blue Economy-based energy transition is expected to not only create local energy security but also sustainably improve the welfare of coastal communities. It should be emphasized that this research is not intended to test a hypothesis, but rather to develop a conceptual model for strategic human resource management based on the Blue Economy.

5. Conclusion And Recommendations

Conclusion

This research confirms that the success of Indonesia's Blue Economy-based energy transition is determined not only by the availability of technology and infrastructure, but also by strategic human resource (HR) management. A case study in Tulungagung shows that:

1. Local human resource readiness remains limited, particularly in technical skills for operating wave energy converters and floatovoltaics. This reinforces the skills gap that needs to be addressed immediately.
2. The strategic human resource management currently implemented is still short-term, with limited training, and has not been integrated into long-term development policies.
3. Perceived benefits and ease of use influence the adoption of technological innovations in coastal communities. Socialization and education are key factors in accelerating the acceptance of marine energy technologies.

4. Coastal community empowerment remains low. They primarily act as technical staff rather than decision-makers, resulting in limited ownership of projects.
5. The justice aspect of the energy transition is not yet optimal. The economic and social benefits of hybrid ocean energy projects have not been distributed equitably, particularly to traditional fishing groups.
6. Blue Economy integration remains partial. Projects emphasize the technical aspects of energy, while opportunities for coastal economic diversification through marine energy have not been maximized.

Thus, it can be concluded that the hybrid marine energy transition in Indonesia requires a strategic human resource management model that is inclusive, adaptive, and participatory, so that the sustainability of the project does not only rely on technology, but also on the readiness and involvement of coastal communities as the leading actors.

Recommendation

1. Strengthening the Competence of Coastal Human Resources.
   The government and state-owned energy companies should develop tiered training programs, specialized marine energy certifications, and knowledge transfer schemes from academics and experts to local communities.
2. Integration of Energy Policy with Human Resource Management.
   The national energy transition policy must prioritize human resources, with a special budget allocation for increasing workforce capacity in coastal areas.
3. Increasing Community Participation
   Hybrid marine energy projects must adopt a participatory approach by involving coastal communities not only as technical personnel, but also in decision-making forums and energy asset management.
4. Implementation of the Just Energy Transition Principle
   The distribution of project benefits must be fair and equitable, by creating new economic opportunities for coastal communities, including traditional fishermen, women, and vulnerable groups.
5. Integration of the Blue Economy Concept
   Marine energy needs to be linked to coastal economic diversification, including energy ecotourism, marine-based creative industries, and energy-related microenterprises. This will strengthen socio-economic benefits while maintaining environmental sustainability.
6. Multi-Stakeholder Collaboration.
   Synergy among the government, state-owned energy enterprises, the private sector, academics, and coastal communities needs to be strengthened through a quadruple helix collaboration model to ensure that the development of hybrid marine energy proceeds more effectively and sustainably.

References

Aziz, M. A. (2015). Pengaruh perbandingan rasio inlet dan outlet pada tabung reservoir oscillating water column (OWC) menggunakan fluida cair (Doctoral dissertation, Institut Teknologi Sepuluh Nopember).

Azizie, M. R., Wicaksono, D. A., & Fitriana, F. (2020). Analisis energi gelombang air laut menggunakan teknologi oscillating water column. Jurnal Teknik Elektro dan Komputasi (ELKOM), 2(1), 1–10.

Ali, M., et al. (2022). Integration of floatovoltaics into hybrid systems: Potential and challenges. Energy Conversion and Management, 258, 115532. https://doi.org/10.1016/j.enconman.2022.115532.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Bahri, A. R. (2018). Studi eksperimental pengaruh dimensi dan letak saluran buang terhadap kinerja perangkat oscillating water column (OWC) (Doctoral dissertation, Universitas Brawijaya).

Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99–120. https://doi.org/10.1177/014920639101700108

Baharoon, D. A., & Ghenai, C. (2024). Feasibility analysis of green hydrogen production from oceanic energy. Heliyon, 10(3), e20645. https://doi.org/10.1016/j.heliyon.2023.e20645

Fatima, S., & Qureshi, K. N. (2021). Floatovoltaics: Performance and economic analysis. Renewable and Sustainable Energy Reviews, 138, 110547. https://doi.org/10.1016/j.rser.2020.110547

Heffron, R. J., & McCauley, D. (2017). The concept of energy justice across the disciplines. Energy Policy, 105, 658–667. https://doi.org/10.1016/j.enpol.2017.03.018

Hossain, M. A., & Sadiq, R. (2021). Hybrid floating solar plant designs: A review. Energies, 14(10), 2751. https://doi.org/10.3390/en14102751

Kumar, S. & Managi, S. (2009). Energy price-induced and exogenous technological change: Assessing the economic and environmental outcomes. Resource and Energy Economics. Volume 31, Issue 4, Pages 334-353

Lund, H. (2007). Renewable energy strategies for sustainable development. Energy, 32(6), 912–919. https://doi.org/10.1016/j.energy.2006.10.017

Lin, W., & Xu, Y. (2023). Conceptual design and optimisation of a novel hybrid device for capturing offshore wind and wave energy. Journal of Ocean Engineering and Marine Energy, 9, 57–73. https://doi.org/10.1007/s40722-023-00298-7

Pauli, G. (2010). The blue economy: 10 years, 100 innovations, 100 million jobs. Paradigm Publications.

Prasetio, B., Chrismianto, D., & Iqbal, M. (2015). Analisa pengaruh geometri dan jumlah sudu terhadap performa Wells turbine. Jurnal Teknik Perkapalan, 3(4).

Rogers, E. M. (2003). Diffusion of innovations (5th ed.). Free Press.

Rezaei, N., et al. (2022). A hybrid renewable energy system for coastal regions: A techno-economic-environmental study. Renewable Energy, 195, 1167–1180. https://doi.org/10.1016/j.renene.2022.06.028

Rodrigues, F., & Baptista, P. (2023). Techno-economic analysis of green hydrogen production as maritime fuel from wave energy. Energies, 17(18), 4683. https://doi.org/10.3390/en17184683

Sona, R. A., & Purwono, S. S. (2014). Analisa kinerja pneumatic wave energy converter (WEC) dengan menggunakan oscillating water column (OWC). Jurnal Teknik ITS, 3(1), G39–G42.

Saragih, M. (2017). Analisis potensi gelombang laut sebagai sumber energi alternatif pembangkit listrik tenaga gelombang laut (PLTGL) dengan sistem oscillating water column (OWC) di perairan Selatan Bali (Doctoral dissertation, Universitas Brawijaya).

Wright, P.M. and McMahan, G.C. (1992). Theoretical Perspectives for Strategic Human Resource Management. Journal of Management, 18, 295-320.

Wijaya, I. W. A., & Wayan, I. (2010). Pembangkit listrik tenaga gelombang laut menggunakan teknologi oscillating water column di Perairan Bali. *Majalah Ilmiah Teknik Elektro*, 9(2), 165–174.

Wang, J., Liu, S., & He, J. (2024). Analysis of hybrid offshore renewable energy sources for power generation: A literature review of hybrid solar, wind, and wave energy systems. *Energy Reports*, 10, 129–148. https://doi.org/10.1016/j.egyr.2024.01.015