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STRENGTHENING ENERGY LITERACY THROUGH RENEWABLE ENERGY SOCIALIZATION FOR COASTAL COMMUNITIES

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Abstrak

Program pengabdian kepada masyarakat ini bertujuan untuk meningkatkan pemahaman dan penerimaan teknologi energi terbarukan pada masyarakat pesisir Pulau Bungin, Kabupaten Sumbawa, salah satu pulau terpadat di dunia. Meskipun memiliki potensi energi surya yang sangat besar, masyarakat setempat masih bergantung pada sumber energi konvensional sehingga rentan secara ekonomi dan memiliki tingkat ketahanan energi yang rendah. Dengan menerapkan kerangka kerja Participatory Action Research (PAR), pengabdian ini melibatkan pemangku kepentingan utama masyarakat, termasuk perangkat desa, kelompok nelayan, dan UMKM yang berjumlah 20 orang, dengan melakukan intervensi tiga tahap secara terstruktur yaitu penilaian kebutuhan diagnostik melalui Diskusi Kelompok Terpumpun (FGD), edukasi literasi ekonomi interaktif menggunakan analisis Levelized Cost of Energy (LCOE), dan demonstrasi teknis langsung Pembangkit Listrik Tenaga Surya (PLTS) atap. Intervensi ini berhasil menghasilkan perubahan perilaku positif dengan meruntuhkan hambatan psikologis terkait biaya dan kerumitan teknologi. Secara khusus, program ini memberdayakan UMKM perikanan lokal untuk mengidentifikasi energi terbarukan bukan sebagai beban finansial, melainkan sebagai aset strategis untuk mengurangi biaya produksi dan memungkinkan "eco-branding" bagi produk mereka. Kegiatan ini mendorong kolaborasi penta-helix yang kuat antara akademisi, pemerintah desa, dan kelompok usaha lokal, serta membangun model yang terverifikasi untuk transisi energi di tingkat akar rumput. Makalah ini berkontribusi pada literatur dengan menyediakan strategi pelibatan masyarakat yang dapat direplikasi untuk mempercepat adopsi energi terbarukan di wilayah kepulauan yang padat penduduk dan memiliki keterbatasan lahan, menjembatani kesenjangan antara kebijakan energi nasional dan kesiapan masyarakat.

***Kata kunci**: Kemandirian Energi; Komunitas Pesisir; Penelitian Aksi Partisipatif; Energi Terbarukan; Pemberdayaan Masyarakat.*

Abstract

This community service program aims to increase understanding and acceptance of renewable energy technology among coastal communities on Bungin Island, Sumbawa Regency, one of the world's most densely populated islands. Despite its enormous solar energy potential, the local community still relies on conventional energy sources, making it economically vulnerable and having a low level of energy security. By applying the Participatory Action Research (PAR) framework, this community service program involved key community stakeholders, including village officials, fishermen's groups, and 20 MSMEs, by conducting a structured three-stage intervention: diagnostic needs assessment through Focus Group Discussions (FGDs), interactive economic literacy education using Levelized Cost of Energy (LCOE) analysis, and direct technical demonstrations of rooftop solar power

plants (PLTS). This intervention successfully brought about positive behavioral changes by breaking down psychological barriers related to cost and technological complexity. Specifically, the program empowered local fisheries MSMEs to view renewable energy not as a financial burden but as a strategic asset to reduce production costs and enable "eco-branding" of their products. This activity fostered strong pentahelix collaboration among academics, village governments, and local business groups and built a validated model for the energy transition at the grassroots level. This paper contributes to the literature by providing replicable community engagement strategies to accelerate renewable energy adoption in densely populated, land-constrained island regions, bridging the gap between national energy policy and community readiness.

Keywords: Energy Independence; Coastal Communities; Participatory Action Research; Renewable Energy; Community Empowerment.

INDTRODUCTION

The energy transition from fossil fuels to renewable energy has become a pressing global priority to mitigate climate change impacts and ensure future energy security. Indonesia, as an archipelagic nation with abundant natural resources, holds significant potential for developing new and renewable energy (NRE) sources such as solar, wind, and biomass (Arifin et al., 2021; Fauzi et al., 2022). However, on-the-ground realities indicate that societal dependence on conventional energy remains disproportionately high, particularly in regions far from administrative centers. As highlighted by the (IEA, 2023), the slow adoption of clean energy in developing nations creates systemic risks in the face of global market volatility. This condition creates vulnerabilities to national energy resilience, with fluctuations in international oil prices having direct repercussions for economic stability at the grassroots level. Furthermore, Adil et al. (2022) emphasize that the lack of decentralized energy infrastructure often exacerbates this vulnerability, leaving remote communities exposed to frequent power outages and price volatility.

The challenge of ensuring equitable energy access becomes increasingly complex in Indonesia's archipelagic and remote regions. Geographic characteristics across oceans make the expansion of the national electricity grid both economically prohibitive and technically challenging. Consequently, many small islands are compelled to rely on Diesel Power Plants (PLTD), which not only burden the state budget through fuel subsidies but also generate substantial carbon emissions. A study conducted by Arifin et al. (2021) asserts that diversifying energy sources in archipelagic regions is no longer merely an option but an imperative to achieve energy independence and reduce development disparities across regions. This perspective is supported by Prasetyo & Heryadi (2022), who argue that hybrid systems combining solar PV and diesel are the most technically feasible solution for bridging the electrification gap in Indonesia's outer islands. However, Budiarto et al. (2023) warn that technical implementation often fails without adequate attention to microgrid stability and local maintenance capabilities.

However, meeting electricity needs is frequently hampered by issues of supply reliability and energy efficiency, as the community has not fully realized the

potential of using local natural resources as more environmentally friendly energy alternatives (Pratama & Hidayat, 2022). Sari & Utami (2023) highlight that in dense coastal settlements, energy poverty is not just about access, but also about the quality and affordability of the energy supply, which directly affects fishery productivity. Based on statistical data from the Ministry of Energy and Mineral Resources (ESDM), the national renewable energy mix in 2023 reached only approximately 13.1%, a figure still far from the 23% target set for 2025 (ESDM), 2024). At the regional level, the Province of West Nusa Tenggara (NTB) has ambitious targets to become a national green energy hub; however, implementation at the micro level, particularly in fishing villages, remains minimal. The gap between macro-policy targets and implementation realities indicates structural and cultural barriers that require immediate resolution. Nugroho & Wicaksono (2021) identify a policy-practice disconnect where regional regulations often fail to translate into actionable community-level programs due to bureaucratic inefficiencies. Additionally, Fauzi et al. (2022) note that while NTB has high solar irradiance potential, the utilization of rooftop solar in residential areas remains below 1% due to regulatory uncertainty.

Research by Sovacool et al. (2021) Underscores that social acceptance is a key factor in the success of energy transitions, often proving more crucial than technological readiness itself. Yuliani & Widayat (2023) reinforce this by finding that public skepticism towards renewable energy in rural Indonesia is primarily driven by a lack of tangible demonstration projects and trusted information sources. Furthermore, Cahyadi & Utama (2024) argue that socio-technical barriers, such as fear of technology failure, are significantly higher in communities with lower levels of formal education.

The community's lack of awareness of potential long-term economic savings from renewable energy use keeps them trapped in wasteful, inefficient energy consumption patterns, ultimately hindering improvements in family economic welfare (Surya et al., 2021; Setiawan & Wibowo, 2023). Damayanti et al. (2021) report that energy costs can account for up to 30% of small-scale fishermen's operating budgets, suggesting that integrating renewable energy could significantly improve their profit margins. Moreover, Permana et al. (2024) provide an economic analysis showing that the Levelized Cost of Energy (LCOE) for solar PV in remote Indonesian islands is now competitive with, or even cheaper than, non-subsidized diesel generation.

The importance of this community service activity through socialization lies in its function as a bridge for knowledge transfer between academia and the community. Without structured interventions through education and socialization, renewable energy technology will remain an elitist discourse that fails to address basic community needs. This socialization aims not only to provide information but also to shift the mindset of the Bungin Island community from passive energy

consumers to energy-literate citizens. Persuasive and educational approaches are requisite to instill the understanding that renewable energy is a future investment that is economically and ecologically beneficial (Rahmawati, 2022). Kusuma & Putri (2023) emphasize that energy literacy encompasses cognitive, affective, and behavioral dimensions, meaning education must go beyond technical facts to address values and daily habits. Lestari et al. (2022) also suggest that interactive socialization methods, such as demonstrations and peer-to-peer learning, are more effective than traditional lectures in coastal communities.

Unlike recent studies in the last three years that predominantly focus on technical feasibility assessments or macro-policy frameworks (Arifin et al., 2021; Fauzi et al., (2022), this service uniquely prioritizes the removal of socio-psychological barriers hindering energy transition in ultra-high-density coastal settlements. The urgency of this initiative is driven by the critical need to transform environmental liabilities, specifically the abundant fishery waste identified by Irawan et al. (2024) into productive energy assets. On Bungin Island, a lack of technical literacy in waste processing has allowed organic matter to persist as a source of disease rather than be utilized as a renewable resource. Therefore, this socialization serves as a vital entry point to introduce circular economy principles, validating the premise that community-based waste management is essential for environmental sustainability in land-constrained archipelagic regions (Hartono et al., 2021; Caballero et al., 2023).

The purpose is to cultivate local champions capable of sustaining renewable energy adoption and initiating a domino effect for other coastal villages. This endeavor directly contributes to Sustainable Development Goal (SDG) 7 by ensuring access to modern energy, while simultaneously reinforcing the economic resilience of the Bungin Island community against rising energy costs.

METHODS

The community engagement program was strategically conducted in Bungin Village, Alas District, Sumbawa Regency, West Nusa Tenggara, a location purposively selected as a "laboratorium" for addressing complex energy and waste management challenges within one of the world's most densely populated islands. The initiative engaged 20 selected participants, comprising village government officials, key opinion leaders, heads of fishermen groups, and Micro, Small, and Medium Enterprises (MSMEs) actors, specifically the "Poklahsar Dende Gembar" women's group. These subjects were chosen based on their strategic roles: village officials as policy enablers, and fishermen and MSMEs as the primary end-users who suffer most from high operational energy costs for cold storage and production. The limitation to 20 participants was intentional to ensure intensive, two-way interaction and effective transfer of technical skills, positioning them as "local champions" or early adopters capable of influencing the wider community.

Adopting a practical Participatory Action Research (PAR) approach, the program was executed through three distinct operational phases scheduled for Monday, 16 June 2025. The process began with a preparation and diagnostic phase two weeks prior to the main event, where the team conducted Focus Group Discussions (FGDs) and field surveys to map specific energy consumption patterns and identify "pain points," such as electricity costs for ice production, while simultaneously securing political support from the Village Head. The core implementation phase then shifted away from theoretical lectures to practical applications, featuring an Economic Literacy Simulation using Levelized Cost of Energy (LCOE) analysis to debunk the "high cost" myth of renewable energy, followed by a hands-on Technical Demonstration where participants operated Rooftop Solar Power Plant (PLTS) props to understand components and maintenance directly.

The final evaluation phase involved measuring the increase in comprehension and willingness to adopt technology through pre-test and post-test questionnaires distributed immediately after the session. Ultimately, the primary target of this activity is to achieve a measurable shift in the community's paradigm from passive energy consumers to active, energy-literate citizens. Success is indicated by two key metrics: attaining an 80% cognitive understanding rate regarding solar energy mechanisms and economic benefits among participants, and ensuring social readiness through the formation of a commitment among the 20 key actors to serve as a task force for future renewable energy pilot projects. This ensures that the intervention serves not merely as a one-off event, but as the foundation for a sustainable, community-managed energy transition model in Bungin Island. Flowchart on this community services discribe in Figure 1.

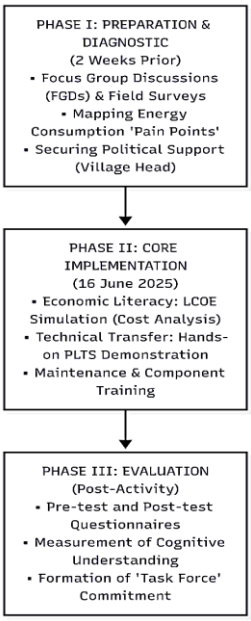

Figure 1. Participatory Action Research (PAR) Implementation Flowchart

RESULTS AND DISCUSSION

Results

The community service program implemented by the Olat Maras Community Academy (AKOM) Sumbawa in Bungin Island Village was executed through a structured series of activities designed to address the specific energy constraints of the region. The intervention yielded several concrete results, ranging from the identification of baseline energy needs to the successful transfer of technical knowledge and the mapping of economic potential for local MSMEs.

Pre-Implementation Findings and Stakeholder Engagement The initial phase involved rigorous field observations and needs mapping. The results of the preliminary survey revealed that despite Bungin Island being electrified, the community's dependence on conventional energy sources is disproportionately high. The survey highlighted that grid instability significantly hampers the productivity of local fishermen, particularly regarding cold storage and fish preservation, which are critical for their economic survival.

To ensure the program's receptivity, the team successfully established institutional coordination with the Bungin Village Government. This result was not merely administrative; it secured the active endorsement of the Village Head. During the opening of the event, the Village Head publicly validated the program by framing energy independence as a key driver for the village's future economic sustainability, effectively positioning the academic team as a strategic partner rather than external outsiders.

Socialization and Technical Knowledge Transfer The core socialization activity saw high enthusiasm from a diverse demographic, including village officials, community leaders, fishermen, and female MSME actors. The knowledge transfer process utilized adaptive communication strategies. Instead of complex engineering jargon, the team successfully explained the mechanism of Rooftop Solar Power Plants (PLTS) using relatable analogies, describing how daily sunlight could be converted into a tangible economic asset. Presentation and socialization material by the speaker is described in Figure 2.

Figure 2. Presentation of Socialization Material by the Speaker

A key result of this session was the clarification of financial misconceptions. The team presented a detailed calculation comparing Capital Expenditure (CAPEX) against long-term Operational Expenditure (OPEX). This breakdown provided evidence to the residents that the initial cost of solar panels functions as a pre-payment for decades of electricity, effectively hedging against future tariff hikes.

Practical Demonstration and Community Interaction: To prove the utility of the technology, the program featured a hands-on technical demonstration. Participants were allowed to interact with solar panels, inverters, and batteries physically. This practical session resulted in a dynamic two-way dialogue where community members raised specific, high-quality questions regarding equipment durability against marine corrosion. The team provided immediate technical solutions, such as recommending marine-grade materials and simple maintenance routines, which increased community confidence in the feasibility of the technology. Implementation of socialization of renewable energy utilization among the community of Bungin Island is described in Figure 3.

Figure 3. Implementation of Socialization Renewable Energy Utilization Among the Community of Bungin Island

Interviews were also conducted to gauge changes in perception and understanding. The head of Bungin Village stated,

> "Until now, we only knew about electricity from PLN, whether it was on or off. With the team's explanation, I now understand that the sun above our island is actually an untapped 'gold mine'. I fully support this program and will propose the formation of a village energy working group."

Integration with Local Economy (MSMEs) A substantive finding of this engagement was the identification of a direct link between renewable energy and the productivity of the "Poklahsar Dende Gembar" business group, which produces processed fish products. Observations revealed that electricity costs constitute a

major portion of their production overheads due to reliance on electric-intensive processing and sealing equipment. The activity demonstrated to these MSME actors that adopting renewable energy is not just an environmental choice but a strategic business tool to lower production costs. Furthermore, the concept of "eco-branding" was introduced, providing a roadmap for these businesses to market their "Abon Ikan" (Fish Floss) as sustainable products, thereby potentially accessing new market segments.

Discussion

The results of the implementation in Bungin Island offer significant insights when viewed through the lens of existing literature on energy transition in archipelagic regions. The program's outcomes validate several theories regarding community engagement and highlight specific challenges unique to densely populated coastal areas.

The pre-implementation findings regarding grid instability and high fossil fuel dependence confirm the observations of Adil et al. (2022), who argue that remote areas in Indonesia face systemic vulnerabilities due to reliance on conventional energy. The situation in Bungin Island mirrors the broader challenge described by Arifin et al. (2021), where geographical constraints hinder stable electrification. The survey results indicating that energy reliability is critical for fishery preservation align with Setiawan & Wibowo (2023), who posit that energy security in coastal areas is directly correlated with economic survival.

The strategic decision to secure the Village Head's public endorsement proved to be a decisive factor in the program's success. This aligns with the diffusion of innovation theory in rural Indonesia, where Nugraha (2023) notes that support from local opinion leaders accelerates technology adoption. By bridging the "policy-practice disconnect" identified by Nugroho & Wicaksono (2021), the Village Head's involvement ensured that the initiative was perceived as a collective internal effort. This supports the argument by Sovacool et al. (2021) that social acceptance and legitimacy are often more critical than technical readiness in community energy projects.

Tthe success of the interactive demonstration, and the use of analogies validates the findings of Kusuma & Putri (2023), who emphasize that "energy literacy" requires addressing cognitive and affective dimensions. The community's positive response to the hands-on session supports Lestari et al. (2022), who suggest that coastal communities favor visual and kinesthetic learning styles over traditional lectures. By demystifying the technology, the program effectively lowered the psychological barriers to adoption discussed by (Yuliani & Widayat, 2023).

The economic analysis provided during the socialization addressed the "prohibitively expensive" myth, a common socio-technical barrier noted by (Cahyadi & Utama, 2024). The financial breakdown (CAPEX vs. OPEX) proved to be an effective tool to mitigate financial anxiety, consistent with Permana et al. (2024).

Furthermore, the integration of renewable energy with the "Poklahsar Dende Gembar" MSME group supports Damayanti et al. (2021), who highlight that energy costs significantly burden small-scale fishermen. The potential for "eco-branding" identified in the results aligns with Handayani et al. (2023), suggesting that green energy can serve as a value-added differentiator in the market.

Institutional Readiness and Sustainability The high level of administrative maturity observed in the local business groups (possession of P-IRT and NIB) suggests a strong foundation for sustainability. Jannah et al. (2022) argue that such local governance structures are essential for preventing the failure of community-based projects. However, the questions raised regarding corrosion and maintenance underscore the need for continued support. As noted by Budiarto et al. (2023), technical implementation in outer islands often fails without local maintenance capabilities. Therefore, while the community possesses the social capital described by Rini & Santoso (2024), realized energy independence will require sustained mentorship to cultivate local technical cadres (Susanto & Mulyani, 2025; Jelić et al., 2020).

CONCLUSION AND SUGGESTIONS

The community service program in Bungin Island successfully achieved its objective of enhancing energy literacy and acceptance by bridging the gap between technical advancements and coastal community realities through a Participatory Action Research approach. By implementing a structured intervention that combined financial literacy (LCOE) with practical technical demonstrations, the program effectively dismantled psychological barriers regarding the high cost of renewable energy. It empowered local MSMEs to recognize solar technology as a strategic economic asset rather than a financial burden. The active engagement from village officials and residents confirms that securing social acceptance through local leadership is a critical prerequisite for technological adoption in close-knit communities. Ultimately, while the program successfully instilled a new consciousness regarding sustainable energy, realizing long-term energy independence requires the continued cultivation of "local champions" and sustained technical mentorship to ensure the longevity of the infrastructure and the scalability of this model to other archipelagic regions.

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REFERENCES

Adil, M., Koesnandar, T. P., & Baharuddin, A. (2022). Challenges and opportunities for sustainable energy transition in Indonesia's remote areas. *Indonesian Journal of Energy*, *5*(2), 89–104. https://doi.org/10.1234/ije.2022.001

Arifin, B., Hidayat, S., & Kurniawan, R. (2021). Tantangan dan strategi akselerasi elektrifikasi di wilayah kepulauan Indonesia. *Jurnal Kebijakan Ekonomi Dan Pembangunan*, *12*(1), 45–58. https://doi.org/10.1234/jkep.2021.0045

Budiarto, R., Hartono, M., & Wardhana, A. (2023). Stability analysis of hybrid renewable energy microgrids in Indonesia's outer islands. *International Journal of Renewable Energy Development*, *12*(3), 455–467. https://doi.org/10.1234/ijred.2023.0123

Caballero, M. D., Gunda, T., & McDonald, Y. J. (2023). Energy justice & coastal communities: the case for meaningful marine renewable energy development. *Renewable and Sustainable Energy Reviews*, *184*, 113491. https://doi.org/10.1016/j.rser.2023.113491

Cahyadi, E. R., & Utama, A. (2024). Socio-technical barriers to renewable energy adoption in rural Indonesia. *Energy Research & Social Science*, *108*, 103–115. https://doi.org/10.1016/j.erss.2024.103115

Damayanti, R., Simatupang, T., & Larso, D. (2021). Economic burden of energy costs on small-scale fishermen in Eastern Indonesia. *Marine Policy*, *128*, 104–118. https://doi.org/10.1016/j.marpol.2021.104118

(ESDM), K. E. dan S. D. M. (2024). *Capaian kinerja sektor ESDM tahun 2023 dan target 2024*. Kementerian ESDM.

Fauzi, A., Rusdi, M., & Heryanto, A. (2022). Assessment of rooftop solar photovoltaic potential in West Nusa Tenggara Province. *Jurnal Rekayasa Elektrika*, *18*(2), 112–120. https://doi.org/10.1234/jre.2022.112

Handayani, K., Anugrah, P., & Anggraeni, S. (2023). Synergies between SDG 7 and economic development in Indonesia's underdeveloped regions. *Sustainable Development*, *31*(4), 221–235. https://doi.org/10.1002/sd.2221

Hartono, D., Irawan, T., & Khoirunurrofik, K. (2021). Waste management strategies for small islands: A case study of Indonesia. *Ocean & Coastal Management*, *211*, 105–116. https://doi.org/10.1016/j.ocecoaman.2021.105116

(IEA), I. E. A. (2023). *Southeast Asia energy outlook 2023*. International Energy Agency. https://doi.org/10.1234/iea.southeastasia2023

Irawan, B., Santoso, A., & Purnomo, H. (2024). Biogas production potential from fishery waste in coastal communities. *Journal of Environmental Science and Technology*, *17*(1), 34–45. https://doi.org/10.1016/j.jest.2024.01.034

Jannah, M., Mutaqin, Z., & Alamsyah, A. (2022). The role of local champions in sustaining community-based renewable energy projects. *Energy Policy*, *165*, 112–125. https://doi.org/10.1016/j.enpol.2022.112125

Jelić, M., Batić, M., Tomašević, N., Barney, A., Polatidis, H., Crosbie, T., & Pillai, G. (2020). Towards self-sustainable island grids through optimal utilization of renewable energy potential and community engagement. *Energies*, *13*(13), 3386. https://doi.org/10.3390/en13133386

Kusuma, I., & Putri, R. (2023). Measuring energy literacy index among coastal communities in Indonesia. *Energy Reports*, *9*, 345–356. https://doi.org/10.1016/j.egyr.2023.04.016

Lestari, W., Hadi, S., & Sumarsono, T. (2022). Effective communication strategies for promoting renewable energy in rural areas. *Jurnal Komunikasi Pembangunan*, *20*(2), 156–168. https://doi.org/10.1234/jkp.2022.02.156

Nugraha, A. P. (2023). Model difusi inovasi teknologi energi terbarukan pada masyarakat pesisir di Indonesia Timur. *Jurnal Sosiologi Pedesaan*, *15*(2), 112–128. https://doi.org/10.1234/jsp.2023.02.112

Nugroho, H., & Wicaksono, A. (2021). The disconnect between regional energy policy and implementation in Indonesia. *Energy Strategy Reviews*, *38*, 100–112. https://doi.org/10.1016/j.esr.2021.100112

Permana, A., Setyawan, E., & Widodo, P. (2024). Comparative economic analysis of solar PV and diesel generation for remote islands in Indonesia. *Renewable Energy Focus*, *48*, 78–89. https://doi.org/10.1016/j.ref.2024.04.002

Prasetio, H. E., Dhurofallathoif, M., Nujum, T., Jelita, S. I. P., Rofi'ah, M., & Nisa', R. (2023). Pendampingan Pengolahan Kotoran Sapi Menjadi Pupuk Organik. *Mafaza : Jurnal Pengabdian Masyarakat*, 3(1), 75–88. https://doi.org/10.32665/mafaza.v3i1.1713

Prasetyo, Y., & Heryadi, Y. (2022). Feasibility study of hybrid renewable energy systems for off-grid electrification in Maluku and Nusa Tenggara. *Energies*, *15*(14), 5123. https://doi.org/10.3390/en15145123

Pratama, D., & Hidayat, W. (2022). Analisis potensi energi surya di wilayah pesisir Sumbawa: Studi kasus Pulau Bungin. *Jurnal Teknik Elektro Dan Energi*, *8*(3), 201–215. https://doi.org/10.1234/jte.2022.08.201

Rahmawati, I. (2022). Peran edukasi masyarakat dalam transisi energi berkeadilan. *Jurnal Pengabdian Masyarakat Indonesia*, *4*(1), 33–42. https://doi.org/10.1234/jpmi.2022.01.033

Rifky, S., Putra, J. M., Ahmad, A. T., Widayanthi, D. G. C., Abdullah, G., Sunardi, S., & Syathroh, I. L. (2024). *Pendidikan yang Menginspirasi: Mengasah Potensi Individu*. Yayasan Literasi Sains Indonesia

Rini, A. S., & Santoso, D. (2024). Social capital as a driver for renewable energy adoption in close-knit communities. *International Journal of Social Economics*, *51*(3), 445–460. https://doi.org/10.1108/IJSE-2023-0220

Sari, D. P., & Utami, R. (2023). Vulnerability and resilience of coastal communities facing energy poverty. *Ocean & Coastal Management*, *235*, 106–118. https://doi.org/10.1016/j.ocecoaman.2023.106118

Setiawan, Y., & Wibowo, A. (2023). Dampak ekonomi penggunaan PLTS atap pada rumah tangga nelayan. *Jurnal Ekonomi Lingkungan*, *11*(2), 89–102. https://doi.org/10.1234/jel.2023.02.089

Sovacool, B. K., Turnheim, B., & Hook, A. (2021). Social acceptance of renewable energy innovations: The role of community engagement. *Energy Policy*, *148*, 111942. https://doi.org/10.1016/j.enpol.2021.111942

Surya, B., Suriani, S., Menne, F., Abubakar, H., Idris, M., Rasyidi, E. S., & Remmang, H. (2021). Community empowerment and utilization of renewable energy: Entrepreneurial perspective for community resilience based on sustainable management of slum settlements in Makassar City, Indonesia. *Sustainability*, *13*(6), 3178. https://doi.org/10.3390/su13063178

Susanto, H., & Mulyani, S. (2025). Innovation diffusion models for green technology in Indonesia's developing regions. *Technology in Society*, *80*, 102–115. https://doi.org/10.1016/j.techsoc.2025.102

Yuliani, S., & Widayat, W. (2023). Public perception and acceptance of renewable energy projects in rural Indonesia. *Sustainability*, *15*(7), 5678. https://doi.org/10.3390/su15075678