

Empowering Sustainability: Localizing SDGs through Solar Energy in Central Java

Silvia Dian Anggraeni¹
Novita Putri Rudiany^{2*}
Rusdi J. Abbas³
M. Fauzi A. Rachman⁴
Sindiana Lauza Nujaiiba⁵
Muhammad Azizi Fernando Reza⁶
Destin Diandri Putri⁷

*International Relations Study Program
Universitas Pertamina
Indonesia*

e-mail: ¹ silvia.da@universitaspertamina.ac.id; ² novita.putri@universitaspertamina.ac.id*; ³ rusdiabbas@universitaspertamina.ac.id; ⁴ mfarachman@universitaspertamina.ac.id; ⁵ sindianalauza@gmail.com; ⁶ azizi.nando@gmail.com; ⁷ putridestin67@gmail.com

ABSTRACT

This study analyzes how provincial governments can contribute to achieving the Sustainable Development Goals (SDGs) through renewable energy development, using the case of solar power plants in Central Java Province. Drawing on the institutional capacity framework proposed by Salvador and Sancho (2021), the research examines four dimensions—strategic, analytical, organizational, and collaborative capacity—to understand how local governments localize SDG 7, which aims to ensure access to affordable, reliable, sustainable, and modern energy for all. Employing a qualitative approach, the study combines primary data from interviews with key provincial stakeholders and secondary data from official reports, policy documents, and academic literature. The findings show that Central Java, one of Indonesia's first solar-producing provinces, achieved a 13.38% renewable energy mix in 2021 through systematic rooftop solar initiatives in government offices, schools, and industries. This demonstrates that strong strategic planning, data-based policy design, and stakeholder collaboration enhance local SDG implementation. However, institutional coordination remains a significant challenge. The study concludes that provincial governments, due to their proximity to communities, hold crucial potential in advancing national sustainability targets, emphasizing the need for stronger inter-agency collaboration to improve renewable energy governance.

Keywords: *Localizing Sustainable Development Goals, Provincial Government, Indonesia, renewable energy, Solar Power Plants*

Penelitian ini menganalisis peran pemerintah provinsi dalam pencapaian Tujuan Pembangunan Berkelanjutan (TPB/SDGs) melalui pengembangan energi terbarukan, dengan studi kasus pembangunan pembangkit listrik tenaga surya di Provinsi Jawa Tengah. Menggunakan kerangka kapasitas institusional dari Salvador dan Sancho (2021), penelitian ini menelaah empat dimensi kapasitas—strategis, analitis, manajerial, dan kolaboratif—untuk memahami bagaimana pemerintah daerah melokalisasi TPB 7 yang berfokus pada akses energi terjangkau, andal, berkelanjutan, dan modern bagi semua. Pendekatan kualitatif digunakan dengan data primer dari wawancara dan data sekunder dari laporan resmi, dokumen kebijakan, serta literatur akademik. Hasil penelitian menunjukkan bahwa Jawa Tengah, sebagai salah satu provinsi pertama penghasil energi surya di Indonesia, mencapai bauran

energi terbarukan sebesar 13,38% pada 2021 melalui program PLTS atap di kantor pemerintah, sekolah, dan industri. Temuan ini menegaskan bahwa perencanaan strategis, kebijakan berbasis data, dan kolaborasi lintas pemangku kepentingan memperkuat pelaksanaan TPB di tingkat lokal, meskipun koordinasi antar lembaga masih menjadi tantangan. Pemerintah provinsi memiliki potensi besar dalam mendorong transisi energi berkelanjutan dan pencapaian target pembangunan nasional.

Kata Kunci: *Lokalisasi Tujuan Pembangunan Berkelanjutan, Pemerintah Provinsi, Indonesia, Energi Berkelanjutan, Pemabngkit Listrik Tenaga Surya*

Introduction

This study focuses on analyzing how a provincial government can play an active role in realizing SDGs through the development of renewable energy. Through a case study of the solar power plant development in Central Java Province, this research will examine local capacities in achieving sustainable development goals, especially Goal 7, which focuses on ensuring access to affordable, reliable, sustainable, and modern energy for all.

Indonesian energy demand is expected to increase by 80%, and electricity demand is projected to triple between 2015 and 2030. These trends highlight the need for sustainable energy solutions in the country. While Indonesia has slightly increased its reliance on fossil fuels, there are positive trends in renewable energy (Tachev, 2022, energytracker.asia). The Indonesian government itself has shown commitment to the development of new renewable energy (NRE). One of them is through Government Regulation – PP no. 79/2014, which states an increase in the target of the NRE mix by at least 23% in 2025 and by at least 31% in 2050, from 8% in 2013. To achieve this target, the national government needs to encourage provincial, district or city governments to optimize the renewable energy potential contained in their respective regions (Saputra, 2020, IESR.or.id). This highlights the urgency of the research.

The implementation of the 2030 Agenda within the Sustainable Development Goals (SDGs) framework tends to target the international, regional, and national levels rather than the local level. However, studies on the role of local government in implementing SDGs are growing. This is because local communities are direct objects of the SDGs, so policies at the local government level have a more direct impact on meeting the needs of these communities. Compared to national governments, local governments have more clear territorial orientation and proximity to citizens (Szetey & Moealemmi, 2021). Moreover, local government involvement has been included in the Voluntary National Reviews (VNRs), although its formal inclusion is still lacking (Morita et al., 2019; Okitasari, Sunam, & Mishra, 2019). Therefore, localizing Agenda 2030 is an avoidable challenge as it is considered a powerful driver that can improve the efficiency of SDGs implementation at national and global levels.

Indonesia has enormous potential for sustainable energy resources. Due to its equator-side location, this country has benefited from a year-round solar energy supply. However, having solar energy potential of up to 3 – 20 GW, based on land suitability, Indonesia has only utilized solar energy of around 400 MW. Several initiatives have been implemented by the government to achieve the goal of a 23% renewable energy mix by 2025. For instance, the Ministry of Energy and Mineral Resources (ESDM) enacted Regulation No. 26 of 2021 regarding Rooftop Solar Power Plants (PLTS). This policy underlines the importance of solar rooftops as a method to enhance the country's energy mix. Moreover, local governments play a crucial role in promoting renewable energy

through the formulation of key policies to accelerate the adoption of renewable energy in the region.

Central Java, as the first solar province in Indonesia, recorded a renewable energy mix of 13.38% in 2021. The Central Java provincial government also continues to encourage the expansion of the use of rooftop solar power plants (PLTS) within local governments as a commitment from the Central Java Solar Province initiative, a collaboration between the Central Java Energy and Mineral Resources Office and the Institute for Essential Services Reform (iesr.or.id). A variety of financing mechanisms from governmental bodies, the private sector, and community contributions have led to the installation of 130 rooftop solar power plants (PLTS) in Central Java. These units collectively possess a capacity of approximately 5,200 kilowatts peak (kWp) (totalenergies.id). Constructed, established, and managed by Total Solar Distributed Generation, the rooftop features 8,340 solar panels spanning 16,500 square meters. It has a total capacity of 3,000 kilowatt peak (kWp) and is capable of producing 4 gigawatt hours (GWh) of renewable electricity annually, which results in preventing 3,340 tons of carbon emissions each year (totalenergies.id).

This investigation aims to draw connections between the Central Java Government's achievements in fostering new renewable energy sources via Rooftop Solar Power Plants and the broader capabilities of local governments to achieve Sustainable Development Goals (SDGs). Specifically, the study seeks to delve into the strategic, analytical, organizational, and collaborative capacities of the Central Java government in integrating the SDGs framework into its local policies and initiatives.

Method

This study employed a qualitative methodology to explore the localization of the Sustainable Development Goals (SDGs) through the development of solar power plants in Central Java Province. Primary data was collected through in-depth interviews with key informants from the Central Java Bappeda, the Central Java Energy and Mineral Resources Office, and the Institute for Essential Services Reform (IESR). These interviews were semi-structured to allow for an in-depth exploration of specific topics, focusing on the role of these organizations in promoting solar projects, the challenges, and opportunities in localizing the SDGs, as well as the impact of these projects on local communities and the environment. Secondary data was collected from white papers, academic journals, policy documents, and relevant online sources to provide a broader context and support key findings.

To ensure the reliability and validity of the study, primary data from interviews are triangulated with secondary data. Triangulation involves cross-verification of information from various sources to identify consistency and discrepancies, thereby increasing the credibility of the research. This comprehensive approach provides an in-depth understanding of how solar power development in Central Java contributes to the localization of the SDGs, highlighting both the successes and challenges faced in this process.

The research question was designed to examine the four main capacities of local governments in realizing the SDGs: strategic, analytical, organizational management, and collaboration. Strategically, the study investigated how local governments plan and prioritize solar projects within the broader framework of sustainable development. Analytically, the study examined the data and evidence used by local authorities to assess the feasibility and impact of these projects. In terms of organizational management, the

study explored the internal processes, resources, and capabilities that enable the effective implementation of solar initiatives. Finally, the study looked at collaboration, focusing on how local governments interact with a wide range of stakeholders, including other government agencies, private sector partners, and civil society, to achieve the SDGs. This multi-faceted approach provides a comprehensive understanding of the capacity required for realized SDGs.

Results and Discussion

The process of adapting the global SDGs agenda to local contexts underscores the need to align international objectives with the actual conditions on the ground. Herrera identifies certain obstacles to the SDGs' successful realization, notably the insufficient consideration of local factors (Herrera, 2019). This issue arises from the global tracking systems' overreliance on policies set by national governments. Although this approach facilitates coordination, it undermines the accountability of SDGs achievements since these goals are meant to address the specific needs of local populations and individuals. The concept of localization offers a more detailed understanding of local community needs and the advancements made (Reddy, 2016). Therefore, it's crucial to shift some powers from the central to local governments and ensure they share the responsibility for fulfilling the SDGs.

Furthermore, Herrera points out that the effective execution of the SDGs hinges on the political and institutional capabilities of governments and their ability to partner with other stakeholders, including the private sector and the public (Herrera, 2019). It's imperative for local authorities to engage civil society organizations as vital partners in development. Civil society can assume at least four pivotal roles in the localization of the development agenda: voicing the concerns of underrepresented groups, acting as watchdogs for accountability, delivering services, and aiding in the gathering, reporting, and monitoring of data (ACSC, 2016).

This study utilizes the framework of institutional capacity proposed by Salvador and Sancho (2021) to evaluate the execution of sustainable development by local governments. This encompasses four main capacities: strategic, analytical, organizational management, and collaboration. Strategic capacity is the skill to craft a vision and set the trajectory for policy objectives. Analytical capacity involves the competence to gather and analyse data to refine the decision-making process, which also encompasses the management of data and its application in formulating policies and standards. Organizational management capacity pertains to the efficient deployment of resources and activities that are integral to sustainable development functions, linked to the organizational structure and the internal mechanics of local government bodies. Lastly, collaborative capacity signifies the proficiency in forming partnerships with external entities to bolster local government efforts in sustainable development implementation.

Building on these theoretical insights, this study applies the institutional capacity framework to the case of the Central Java Provincial Government's efforts to localize the SDGs through solar power plant development. The framework by Salvador and Sancho (2021) provides a useful analytical lens to examine how strategic vision, data-based analysis, organizational structures, and collaboration among stakeholders contribute to effective SDG implementation at the local level. By analyzing these four capacities—strategic, analytical, organizational management, and collaborative—within the context of Central Java's renewable energy initiatives, this research connects the broader theoretical discussions on SDG localization (Herrera, 2019; Reddy, 2016) to practical, region-specific governance strategies. This approach not only enriches the

understanding of how global development goals are operationalized locally but also highlights the critical role of subnational governments in achieving national sustainability targets.

Strategic Capacity

Central Java has demonstrated a strong strategic capacity in developing renewable energy through a clear vision, strategic planning, and significant political will. The provincial government has integrated renewable energy components into development policies to increase renewable energy contributions by up to 21% as part of the Regional Medium-Term Development Plan (RPJMD). This strategy includes national planning, budget allocation, collaborative action with relevant institutions, and ongoing evaluation to ensure alignment with national targets (IESR, 2024). Central Java Province, in this case, supports efforts made at the international level to switch from fossil fuels to renewable energy. Central Java has demonstrated strategic planning by identifying suitable locations for various renewable energy sources, including solar, hydropower, biogas, and wind turbines. The focus on solar energy is strategic due to Indonesia's tropical climate, which makes it suitable for implementing solar energy.

The Central Java Provincial Government, through the Energy and Mineral Resources Office (ESDM), plays a strategic role in achieving the Sustainable Development Goals (SDGs) by developing Solar Power Plants (PLTS). They have prepared a Strategic Plan (Renstra) that involves various stakeholders to focus on energy security and new and renewable energy. The Energy Independent Village Program (*Program Desa Mandiri Energi*) encourages energy independence at the village level, with around 27.48% of villages utilizing solar PV (IESR, 2023). In addition, the Energy and Mineral Resources Office is improving education and renewable energy infrastructure in remote areas, including the construction of biogas and solar water pumps. Collaboration with various organizations and local governments ensures synergy in the program's implementation while energy-related policies and regulations continue to be strengthened to accelerate the energy transition. These steps show the commitment of the Central Java Energy and Mineral Resources Office to supporting the achievement of the SDGs and improving the welfare of the society through renewable energy initiatives.

The strategic capacity of the Central Java Provincial Government in development, including the renewable energy sector like solar PV, is underpinned by several key regulations. One of these is the Central Java Provincial Regulation Number 6 of 2024, which outlines the Regional Long-Term Development Plan (RPJPD) for 2025-2045, detailing the vision, mission, policy direction, and main development goals for the next 20 years. In the context of renewable energy, the RPJPD emphasizes the importance of developing new and renewable energy sources (NRE) to achieve energy security and reduce dependence on fossil fuels. Additionally, Law Number 25 of 2004 on the National Development Planning System provides a crucial foundation governing an integrated development planning system from the central to regional levels. In the case of renewable energy, this law encourages the preparation of development plans that include the development of NRE as part of national efforts to achieve sustainable development and energy security. The Central Java Governor Regulation Number 38 of 2019 on Main Performance Indicators for the Central Java Provincial Government and Regional Apparatus also plays a significant role in measuring and evaluating development performance. These regulations ensure that development planning and implementation in Central Java adhere to sustainability and energy security principles.

The implementation of renewable energy regulations in Central Java encounters several significant challenges. These include the high initial costs for constructing infrastructure

like solar panels and wind farms, and the issue of electricity oversupply exceeding 30%, which diminishes incentives to develop new energy sources (Cahyo, 2024). Additionally, public understanding of the benefits and uses of solar power plants remains low, necessitating more intensive education and outreach efforts (Putri et al. 2023). Dependence on imported technology further escalates costs and slows down the implementation process. Despite supportive policies and regulations, improved coordination between institutions and consistency in policy implementation is still needed to ensure the successful transition to renewable energy in Central Java.

Analytical Capacity

The data-driven approach in the formulation of renewable energy policies in Central Java demonstrates the commitment of local governments to ensure that the policies taken are based on accurate and relevant information. BAPPEDA of Central Java, for example, uses the PEMIRSA (SDGs Indicator Metadata Service) application to monitor and evaluate the progress of renewable energy projects (BPS Jateng, 2023). This application helps in the collection and analysis of data needed to track the achievement of the Sustainable Development Goals (SDGs) in the provinces.

The Energy and Mineral Resources Service (ESDM) of Central Java Province also plays an important role in coordinating with local governments to allocate budgets and formulate policies that support the development of renewable energy. The study conducted by this agency helps determine the optimal location for the construction of Solar Power Plants (PLTS) and other renewable energy projects. In addition, monthly Operational Work Plans (RKO) and regular monitoring and evaluation are carried out to ensure that the goals that have been set can be achieved (BAPPEDA Jateng, 2023). Studies conducted by the ESDM of Central Java Province help identify areas with high solar energy potential. This data includes solar radiation levels, local energy needs, and geographic conditions. In addition, there is a draft roadmap based on comprehensive data analysis and includes concrete steps to increase the use of solar energy (Dwiatmoko, 2021). This target includes increasing the capacity of solar power plants and integrating renewable energy into the province's energy mix.

The Institute for Essential Services Reform (IESR) provides technical support, research, and policy recommendations to assist local governments in decision-making. The collaboration between IESR and the local government of Central Java began around 2019 and has developed into a formal partnership involving various meetings and discussions. This support from the IESR is crucial in ensuring that policies are based on evidence and in-depth analysis. In addition, to support the implementation of data-based policies, IESR also collaborates with the Central Java Provincial Government in increasing the capacity of human resources. Training and workshops are held to improve the analytical and technical skills of government employees in managing and analyzing renewable energy data (Kementerian ESDM, 2019).

As a result of the development of the analytical capacity of the province of Central Java, several projects have been implemented, including (Dwiatmoko, 2021): (1) Solar Home System (SHS): 575 units built with a capacity of 33.1 KWp from 2013 to 2018. (2) Communal Off-Grid Solar PV: 22 units with a total capacity of 560 kWp. (3) Solar Public Street Lighting (PJUTS): Around 12,000 units built until 2020. (4) Water Pump Solar Power Plant: Built in Kaliwungu Lor Village, Purworejo, to drain 18 ha of agricultural land with a capacity of 11 KWp. (5) Rooftop Solar PV: Until the end of September 2021, around 260 units of rooftop solar users with a total capacity of around 8000 kWp.

Organization Management Capacity

The organizational structure and decision-making process of the Central Java Government for developing renewable energy, particularly Solar Power Plants (PLTS), involves a multi-tiered approach. The Governor and local governments establish policies and strategic directions to align with national energy policies and sustainability goals. The Energy and Mineral Resources Office (Dinas ESDM) is responsible for implementing and managing these energy projects, including planning, coordination, and monitoring. Local Government Units (LGUs), such as cities and districts, participate in local implementation, site selection, and community engagement. Public-private partnerships are crucial for securing funding, facilitating technology transfer, and sharing expertise, while community involvement ensures that projects address local needs and gain public support. The regulatory framework, guided by national and regional policies, provides incentives for renewable energy investments and sets guidelines for environmental impact assessments. This process integrates centralized strategic decision-making with decentralized implementation and operational decisions, involving local government units and community stakeholders to ensure the effective and sustainable development of solar PV projects.

The organizational structure and decision-making process of the Central Java Government for renewable energy development, particularly Solar Power Plants (PLTS), have several significant implications. By engaging multiple levels of government and various stakeholders, the structure enhances the coordination and efficient implementation of renewable energy projects, ensuring that strategic decisions are well-aligned with local needs and conditions. Public-private partnerships drive investment and innovation by leveraging the strengths of both sectors, with private companies providing capital, advanced technology, and expertise, while the public sector offers regulatory support and incentives. Emphasizing community involvement ensures that projects are tailored to local needs and gain public support, leading to smoother project implementation and higher acceptance rates among local populations. The regulatory framework ensures that projects comply with environmental standards and sustainability goals, helping to mitigate negative environmental impacts and promote long-term sustainability. Decentralizing operational decisions to local government units allows for more responsive and adaptive management of projects, enabling local authorities to address specific challenges and opportunities more effectively than a centralized body. By aligning regional policies with national energy policies, the structure supports the broader national agenda for renewable energy and sustainability, helping to achieve national targets for renewable energy adoption and carbon reduction. Overall, this structure facilitates a comprehensive and integrated approach to renewable energy development, balancing strategic oversight with local implementation, and fostering collaboration across different sectors and levels of government.

The organizational structure and decision-making process for renewable energy development in Central Java, particularly for Solar Power Plants (PLTS), face several challenges. These include the complexity of coordinating multiple government levels and stakeholders, which requires effective communication and management to align goals. Navigating the regulatory framework can be complex and time-consuming, with potential conflicts between national and regional regulations causing delays and additional administrative burdens. Securing consistent funding and investment is challenging due to economic fluctuations and policy changes that can impact investor confidence and resource availability. Technical and infrastructure limitations, especially in remote areas, pose difficulties in developing and maintaining necessary infrastructure, and addressing grid integration and energy storage issues. Community resistance can

arise from a lack of understanding, misinformation, or concerns about environmental and livelihood impacts. Capacity building is crucial to ensure local government units and communities have the skills and knowledge to manage and support renewable energy projects. Balancing development with environmental protection is essential to avoid negative impacts on ecosystems and biodiversity. Frequent policy changes can create uncertainty for developers and investors, highlighting the need for consistent and stable policies to foster long-term planning and investment. Addressing these challenges requires a concerted effort from all stakeholders, including government agencies, private sector partners, and local communities, to ensure the successful and sustainable development of renewable energy projects in Central Java (IEA, 2022; IESR, 2023).

Collaborative Capacity

Collaboration is a key component of Central Java's strategy to realize the SDGs, with the involvement of various stakeholders and partnerships. Bappeda Central Java collaborates with local governments, national institutions, and the community to promote renewable energy. The Central Java Provincial Energy and Mineral Resources Office collaborates with PLN for on-grid projects and IESR for office setup, socialization, and campaigns related to renewable energy, as well as partnering with companies such as Danone-AQUA, Nike SCL, and Djarum. IESR is also collaborating with PLN and educational institutions to promote renewable energy through pilot projects in various regions, targeting SMEs and educational institutions such as Islamic boarding schools. Community participation is essential, with efforts to increase awareness and acceptance of renewable energy projects.

Monitoring the implementation of renewable energy policies in Central Java involves several key stakeholders. The Central Java Provincial Government, especially the Energy and Mineral Resources Agency (ESDM), plays a central role in overseeing and coordinating these efforts. They are working closely with the Institute for Essential Services Reform (IESR), which provides expertise and support in promoting the energy transition and low-carbon development (IESR, 2022). In addition, the State Electricity Company (PLN), a state-owned power company, monitors and evaluates the performance of renewable energy projects, ensuring their suitability with national and regional energy goals. Other important stakeholders include the Environment and Forestry Service, the Industry and Trade Service, and the Regional-Owned Enterprise (BUMD) PT Jateng Petro Energi (JPEN), all of which are working together to support the development and implementation of renewable energy initiatives.

Central Java Province also collaborates with foreign partners in developing renewable energy projects, especially solar PV. One of the main funding schemes is the Just Energy Transition Partnership (JETP), which funds 52 solar projects with a total capacity of 2.09 Gigawatts (GW) and an investment of approximately USD 2.38 billion (Zahira, 2023). These projects cover a wide range of locations in Central Java, including the construction of solar power plants in industrial estates and remote areas to improve access to clean energy. One example is the solar power plant in the KM 379A Rest Area of the Batang-Semarang Toll Road which uses 11 solar panels for the operation of refueling stations and offices. In addition, these projects are also expected to meet the bankability criteria set by international borrowers, so policy reforms related to the Domestic Content Level (TKDN), auction mechanisms, and power purchase agreements (PPAs) are very important (Zahira, 2023).

Conclusion

The Central Java Provincial Government has a strong capacity to promote renewable energy, especially solar power, through a comprehensive strategic, analytical, organizational, and collaborative approach. The government has integrated renewable energy into regional development policies, using data to formulate effective policies, and ensuring efficient resource management and good coordination among various stakeholders. Collaboration with educational institutions, private sector partners, and local communities is critical in achieving renewable energy targets and supporting the achievement of the Sustainable Development Goals (SDGs) in the energy sector. Key challenges faced include high infrastructure costs, the need to convince stakeholders of the importance of the energy transition, regulatory challenges, and community engagement. However, by continuing to develop renewable energy infrastructure and increasing the contribution of renewable energy in the regional energy mix, local governments play a key role in ensuring sustainability and long-term well-being for communities. Of the four existing capacities, collaborative capacities still seem to be weak in implementation. Despite efforts to engage various stakeholders, the challenges in coordination and collaboration between different levels of government and the private sector show that there is still room for improvement. Community engagement and community participation also require increased efforts to ensure that renewable energy projects are accepted and supported by all parties involved. Strengthening this collaborative capacity will be critical to overcoming existing barriers and achieving more ambitious renewable energy goals. The Central Java Provincial Government can leverage international frameworks and regulations in the energy transition to inspire and guide local policies. In addition, collaboration with international partners and participation in global discussions on renewable energy can help access advanced technologies, funding, and best practices that can be applied at the local level. Thus, international relations not only strengthen local capacity but also ensure that renewable energy initiatives in Central Java are aligned with global efforts to achieve energy sustainability.

Bibliography

- ACSC. (2016). The Role of Civil Society in Localising the Sustainable Development Goals. Johannesburg: Democracy Development Program. Retrieved from <https://effectivecooperation.org/system/files/2019-04/the-roles-of-civil-society-in-localizing-the-sdgs.pdf>
- BAPPEDA Jateng. 20 November 2023. 'Arah Kebijakan Pembangunan Provinsi Jawa Tengah Tahun 2025-2045', in <https://bappeda.salatiga.go.id/wp-content/uploads/2023/11/3-Arah-Pembangunan-dan-Kebijakan-Provinsi-Jawa-Tengah.pdf>, Accessed 8 November 2024.
- BPS Jateng. 25 August 2023. 'Launching Aplikasi Pelayanan Metadata Indikator SDGs (Pemirsa SDGs)', in <https://jateng.bps.go.id/id/news/2023/08/25/565/launching-aplikasi-pelayanan-metadata-indikator-sdgs--pemirsa-sdgs-.html>, Accessed 8 November 2024.
- Cahyo, A.N. 21 Okt 2024. 'Revolusi Energi Terbarukan di Jawa Tengah: Masa Depan Pembangkit Listrik yang Lebih Hijau dan Berkelanjutan', in <https://www.kompasiana.com/ajinurcahyo3123/67167a0734777c5838028aa2/revolusi-energi-terbarukan-di-jawa-tengah-masa-depan-pembangkit-listrik-yang-lebih-hijau-dan-berkelanjutan>, Accessed 8 November 2024.

- Dwiatmoko, S. 6 October 2021. 'Perkembangan Jateng Solar Province di Jawa Tengah', in https://iesr.or.id/wp-content/uploads/2021/10/1-Update_Bussiness-Forum-Paparan-Kadis-ESDM.pdf, Accessed 25 August 2024.
- Herrera, V. (2019). Reconciling global aspirations and local realities: Challenges facing the Sustainable Development Goals for water and sanitation. *World Development*, 118, 106-117.
- IEA. 21 Januari 2022, 'Scaling Up Renewables in the Java-Bali Power System: A Case Study', in <https://www.iea.org/articles/scaling-up-renewables-in-the-java-bali-power-system-a-case-study>, Accessed 22 August 2024.
- IESR. 12 Sept 2024. 'Promoting Sustainable Energy in Central Jawa', in <https://iesr.or.id/en/promoting-sustainable-energy-in-central-java/> Accessed 12 October 2024
- IESR. 7 July 2023, 'Encouraging the Growth of Renewable Energy Investments in Central Jawa', in <https://iesr.or.id/en/encouraging-the-growth-of-renewable-energy-investments-in-central-java/>, Accessed 11 October 2024.
- IESR. 1 March 2023. 'Dinas ESDM Provinsi Jawa Tengah Libatkan IESR dalam Penyusunan Rancangan Renstra Tahun 2024 – 2026', in <https://iesr.or.id/dinas-esdm-provinsi-jawa-tengah-libatkan-iesr-dalam-penyusunan-rancangan-renstra-tahun-2024-2026/>, Accessed 2 November 2024
- IESR. 8 December 2022. 'The Synergy of Central Java Provincial Government to Realize Low Carbon Development', in <https://iesr.or.id/en/the-synergy-of-central-java-provincial-government-to-realize-low-carbon-development/>, Accessed 10 August 2024.
- IESR. (2022). "Pemprov Jateng Genjot Pemanfaatan PLTS Atap di Lingkungan Pemda". Diakses melalui <https://iesr.or.id/pemprov-jateng-genjot-pemanfaatan-plts-atap-di-lingkungan-pemda>.
- Kementerian ESDM. 10 October 2019, 'Kebijakan, Regulasi, dan Inisiatif Pengembangan Energi Surya di Indonesia', in <https://iesr.or.id/wp-content/uploads/2019/10/2019-10-10-Bahan-Paparan-Akselerasi-PLTS-Mencapai-65-GW-pada-2025-IESR.pdf>, Accessed 8 November 2024.
- Morita, K., Okitasari, M., & Masuda, H. (2019). Analysis of National and Local Governance Systems to Achieve the Sustainable Development Goals: Case Studies of Japan and Indonesia. *Sustainability Science*, 15, 179-202.
- Okitasari, M., Sunam, R., & Mishra, R. e. (2019). Governance and national implementation of the 2030 agenda : lessons from voluntary national reviews. *United Nations Univ Inst Adv Study Sustain Br*, 18, 1-4.
- Putri, S.A., Alfirdaus, L.K., & Marlina, N. 2023. "Analisis Hambatan Pemanfaatan Plts Di Provinsi Jawa Tengah Dalam Upaya Meningkatkan Peran Energi Baru Dan Energi Tebarukan Pada Tahun 2020-2022", *Journal of Politic and Government Studies*, 12(3), pp.88-110.
- Reddy, P. S. (2016). Localizing the Sustainable Goals (SDGs): the Role of Local Government in Context. *African Journal of Public Affairs*, 9(2), 1-15.
- Salvador, M., & Sancho, D. (2021). The Role of Local Government in the Drive for Sustainable Development Public Policies. An Analytical Framework Based on Institutional Capacities. *Sustainability*, 13(5978), 1-17.
- Szetey, K., & Moealemmi, E. e. (2021). Co-creating local socioeconomic pathway for achieving the Sustainable Development Goals. *Sustain. Sci*, 1-17.
- TotalEnergies. 2020. "PLTS ATAP TERBESAR DI JAWA TENGAH, INDONESIA: TOTAL SOLAR DG DUKUNG KOMITMEN KEBERLANJUTAN DANONE YANG SEJALAN DENGAN AGENDA PEMERINTAH", dalam <https://totalenergies.id/id/artikel/berita-acara/plts-atap-terbesar-di-jawa-tengah-indonesia-total-solar-dg-dukung-komitmen>

Zahira, N. 6 Nov 2023. '52 Proyek PLTS Jadi Prioritas Dana JETP, Investasi Rp 36 Triliun', in <https://katadata.co.id/ekonomi-hijau/energi-baru/6548ca7cbec97/52-proyek-plts-jadi-prioritas-dana-jetp-investasi-rp-36-triliun>, Accessed 10 August 2024.