TRANSFORMING ENERGY POLICY IN INDONESIA: ADDRESSING GENDER BIAS AND PROMOTING WOMEN'S EMPOWERMENT IN THE RENEWABLE ENERGY SECTOR

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Abstract

This study analyses the role and engagement of women in Indonesia's renewable energy transition through a feminist perspective, emphasising the shift from gender-neutral frameworks to inclusive, equitable, and justice-oriented approaches. The research employs document analysis of national energy plans, with a focus on the "Sumba Iconic Island" programme as a case study, complemented by a literature review that addresses ethics of care, distributive justice (Gilligan, Noddings, Rawls), and feminist perspectives—specifically standpoint theory and intersectionality. It highlights the patriarchal biases embedded in technocratic and macroeconomic policy frameworks. Although Indonesia possesses a wealth of renewable resources—including solar, bioenergy, and ocean waves—women's experiential knowledge and perspectives remain underrepresented in energy policy and planning. Existing evidence indicates that empowering women as technicians and energy educators enhances technology adoption, social effectiveness, and long-term sustainability. A comparative analysis of Iceland and Germany shows that mandatory gender-equity reporting and inclusive public consultations—guided by feminist perspectives—position women as strategic partners in energy decision-making, rather than passive beneficiaries. Proposed actions include the adoption of feminist-informed Gender Responsive Budgeting (GRB) in energy-sector funding, revising technical regulations to require assessments of gender-power impacts, and establishing women's energy advisory forums at both national and regional levels. These measures aim to reshape Indonesia's energy transition into a process that is equitable, inclusive, fundamentally feminist, and environmentally sustainable.

***Keywords**: Women's Engagement; Renewable Energy Transition; Feminist Political Ecology; Gender-Responsive Budgeting (GRB); Intersectionality.*

A. Introduction

The shift towards cleaner and more sustainable energy sources represents a critical necessity that requires immediate implementation, particularly in Indonesia.[1] The climate crisis,

[1] Satar Bakhsh et al., "Strategy Towards Sustainable Energy Transition: The Effect of Environmental Governance, Economic Complexity and Geopolitics," *Energy Strategy Reviews* 52 (March 1, 2024): 101330, doi:10.1016/j.esr.2024.101330; Chien-Heng Chou, Sa Ly Ngo, and Phung Phi Tran, "Renewable Energy Integration for Sustainable Economic Growth: Insights and Challenges via Bibliometric Analysis," *Sustainability* 15, no. 20 (2023): 15030, doi:10.3390/su152015030; Harshita Jain, "From Pollution to Progress: Groundbreaking Advances in Clean Technology Unveiled," *Innovation and Green Development* 3, no. 2 (June 1, 2024): 100143, doi:10.1016/j.igd.2024.100143; Ahmed I. Osman et al., "Cost, Environmental Impact, and Resilience of Renewable Energy Under a Changing Climate: A Review," *Environmental Chemistry Letters* 21,

reliance on fossil fuels, and rising energy demand necessitate transitioning to renewable energy sources, including solar, wind, hydro, and bioenergy.[2] The Climate Transparency Report[3] highlights the emission issues in Indonesia, which stem from its high dependence on fossil fuels, particularly coal, approximately 62% of total electricity generation. Despite a decrease in per capita emissions, projections indicate that without more ambitious measures, national emissions are expected to increase by 421% above 1990 levels by 2030. Despite committing to phase out coal by 2040, Indonesia's national energy plan lacks a clear commitment to reducing coal consumption, remaining contingent on substantial international financial support. Furthermore, the ongoing reliance on coal, coupled with a transport sector dependent on fossil fuels and increasing methane emissions from waste, indicates a trajectory that is fundamentally misaligned with the 1.5°C global warming target.

The combustion of fossil fuels not only emits carbon dioxide (CO_2), but also generates sulfur dioxide (SO_2), nitrogen oxides (NOx), and fine particulate matter (PM2.5).[4] These substances pose significant risks to human health and contribute to worsening air pollution.[5]

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no. 2 (April 1, 2023): 741–64, doi:10.1007/s10311-022-01532-8; Budy P. Resosudarmo, Jahen F. Rezki, and Yuventus Effendi, "Prospects of Energy Transition in Indonesia," *Bulletin of Indonesian Economic Studies* 59, no. 2 (May 4, 2023): 149–77, doi:10.1080/00074918.2023.2238336.

2 Jerry L. Holechek et al., "A Global Assessment: Can Renewable Energy Replace Fossil Fuels by 2050?," *Sustainability* 14, no. 8 (2022): 4792, doi:10.3390/su14084792; Krishna Kumar Jaiswal et al., "Renewable and Sustainable Clean Energy Development and Impact on Social, Economic, and Environmental Health," *Energy Nexus* 7 (September 1, 2022): 100118, doi:10.1016/j.nexus.2022.100118; Moses Jeremiah Barasa Kabeyi and Oludolapo Akanni Olanrewaju, "Sustainable Energy Transition for Renewable and Low Carbon Grid Electricity Generation and Supply," *Frontiers in Energy Research* 9 (2022): 743114, doi:10.3389/fenrg.2021.743114; Anam Kalair et al., "Role of Energy Storage Systems in Energy Transition from Fossil Fuels to Renewables," *Energy Storage* 3, no. 1 (February 1, 2021): e135, doi:10.1002/est2.135; R.E.H. Sims, "Renewable Energy: A Response to Climate Change," *Solar Energy* 76, no. 1 (January 1, 2004): 9–17, doi:10.1016/S0038-092X(03)00101-4.

3 Climate Transparency, *Indonesia Country Profile 2022* (Climate Transparency, 2022), https://www.climate-transparency.org/countries/asia/indonesia.

4 Lílian Lefol Nani Guarieiro and Aline Lefol Nani Guarieiro, "Change with Use of Biofuel?," in *Biofuels: Economy, Environment and Sustainability* (BoD – Books on Demand, 2013), 357; M Mercedes Maroto-Valer, Chunshan Song, and Yee Soong, *Environmental Challenges and Greenhouse Gas Control for Fossil Fuel Utilization in the 21st Century* (Springer Science & Business Media, 2012); Pratichi Singh, Deepak Yadav, and S. Pandian E, "Link Between Air Pollution and Global Climate Change," in *Global Climate Change*, ed. Suruchi Singh et al. (Elsevier, 2021), 79–108, doi:10.1016/B978-0-12-822928-6.00009-5.

5 Afifa et al., "Air Pollution and Climate Change as Grand Challenges to Sustainability," *Science of The Total Environment* 928 (June 10, 2024): 172370, doi:10.1016/j.scitotenv.2024.172370; Marilena Kampa and Elias Castanas, "Human Health Effects of Air Pollution," *Environmental Pollution* 151, no. 2 (January 1, 2008): 362–67, doi:10.1016/j.envpol.2007.06.012; Ravi Naidu et al., "Chemical Pollution: A Growing Peril and Potential Catastrophic Risk to Humanity," *Environment International* 156 (November 1, 2021): 106616, doi:10.1016/j.envint.2021.106616; Gibson Owhoro Ofremu et al., "Exploring the Relationship between Climate Change, Air Pollutants and Human Health: Impacts, Adaptation, and Mitigation Strategies," *Green Energy and Resources*, May 10, 2024, 100074, doi:10.1016/j.gerr.2024.100074; Yali Zhang et al., "The Impact of Fossil Fuel Combustion on Children's Health and the Associated Losses of Human Capital," *Global Transitions* 5 (January 1, 2023): 117–24, doi:10.1016/j.glt.2023.07.001.

Fossil fuels exert environmental pressure throughout their lifecycle.[6] Upstream activities, notably coal exploration, mining, and oil drilling lead to deforestation and ecosystem damage;[7] downstream, the combustion of these fuels results in water, soil, and air pollution, primarily due to waste and fly ash produced during the process.[8] Consequently, Indonesia's reliance on these processes remains fundamentally incompletable with its broader ecological commitments – placing numerous plant and animal species under significant pressure and increasing their risk of extinction due to environmental degradation.[9]

Indonesia possesses plentiful renewable energy sources across its archipelago, most notably in solar energy (207.8 GW), followed by hydropower (94.6 GW), wind (60.6 GW), bioenergy (32.6 GW), geothermal (23.9 GW), and wave energy (17.9 GW). Despite this capacity, 2020 installation figures remained modest, with hydropower leading at 6.1 GW, followed by geothermal (2.1 GW), biofuel (1.9 GW), wind (154.3 MW), and solar (153.8 MW). Indonesia's tropical climate, large agricultural area, and forests encourage various biomass sources, including wood waste, rice husks, maize waste, and crops from devoted plantations. Production forests total 74.4 million hectares; 1.3 millions of those have been set aside for energy plantations run by 32 businesses. Regionally, Sumatra has the most biomass potential with 15,588 MWe, followed by Java-Bali, Kalimantan, Sulawesi, Nusa Tenggara, and Maluku-

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6 Michael Burger and Jessica Wentz, "Evaluating the Effects of Fossil Fuel Supply Projects on Greenhouse Gas Emissions and Climate Change Under NEPA," *William & Mary Environmental Law and Policy Review* 44, no. 2 (2020): 423529, https://scholarship.law.wm.edu/wmelpr/vol44/iss2/4/; Noel Healy, Jennie C. Stephens, and Stephanie A. Malin, "Embodied Energy Injustices: Unveiling and Politicizing the Transboundary Harms of Fossil Fuel Extractivism and Fossil Fuel Supply Chains," *Energy Research & Social Science* 48 (February 1, 2019): 219–34, doi:10.1016/j.erss.2018.09.016.

7 Jill E. Johnston, Esther Lim, and Hannah Roh, "Impact of Upstream Oil Extraction and Environmental Public Health: A Review of the Evidence," *Science of The Total Environment* 657 (March 20, 2019): 187–99, doi:10.1016/j.scitotenv.2018.11.483; Valentine E. Nnadi, Emeka L. Udokporo, and Obiageli J. Okolo, "Petroleum Production Activities and Depletion of BiodiversityBiodiversity: A Case of Oil Spillage in the Niger Delta," in *Handbook of Environmentally Conscious Manufacturing*, ed. Christian N. Madu (Cham: Springer International Publishing, 2022), 95–111, doi:10.1007/978-3-030-75834-9_9; Angie Tatiana Ortega-Ramírez et al., "Environmental Aspects of Natural Resources and Their Relationship to the Exploitation of Fossil Fuels: A Reflection on Sustainability," *Fuentes, El Reventón Energético* 20, no. 2 (2022): 43–54, doi:10.18273/revfue.v20n2-2022004.

8 Yi Chen et al., "A Comprehensive Review of Toxicity of Coal Fly Ash and Its Leachate in the Ecosystem," *Ecotoxicology and Environmental Safety* 269 (January 1, 2024): 115905, doi:10.1016/j.ecoenv.2023.115905; Joël Foramitti, Ivan Savin, and Jeroen C.J.M. van den Bergh, "Regulation at the Source? Comparing Upstream and Downstream Climate Policies," *Technological Forecasting and Social Change* 172 (November 1, 2021): 121060, doi:10.1016/j.techfore.2021.121060; Nathan Ratledge, Laura Zachary, and Chase Huntley, "Emissions from Fossil Fuels Produced on US Federal Lands and Waters Present Opportunities for Climate Mitigation," *Climatic Change* 171, no. 1 (March 14, 2022): 11, doi:10.1007/s10584-021-03302-x.

9 N. Butt et al., "Biodiversity Risks from Fossil Fuel Extraction," *Science* 342, no. 6157 (October 25, 2013): 425–26, doi:10.1126/science.1237261; Desmond Leddin, "The Impact of Climate Change, Pollution, and Biodiversity Loss on Digestive Health and Disease," *Gastro Hep Advances* 3, no. 4 (January 1, 2024): 519–34, doi:10.1016/j.gastha.2024.01.018; Shaye Wolf et al., "Scientists' Warning on Fossil Fuels," *Oxford Open Climate Change* 5, no. 1 (January 1, 2025): kgaf011, doi:10.1093/oxfclm/kgaf011.

Papua.[10] Principal biomass resources include palm oil waste, rice husks, and municipal garbage, alongside rubber, corn, wood, and sugarcane. Leveraging these renewables sustainably could facilitate a strategic transition from fossil fuel dependency. If managed equitably and inclusively, this change not only advances environmental objectives but also mitigate energy poverty and creates opportunities for green employment, supporting a more resilient and just energy future.

Indonesia has committed to facilitating the energy transition towards a cleaner and more sustainable system, as evidenced by various national strategic policies. The National Energy Master Plan, created under Presidential Regulation No. 22 of 2017, aims for a renewable energy mix of 23% by 2025 and 31% by 2050. As of 2023, renewable energy achievement is approximately 13.1%, indicating that the rate of advancement remains significantly below the established target. The government has issued Presidential Regulation No. 112 of 2022 concerning accelerating renewable energy development for electricity supply. This regulation establishes retail electricity prices for renewable energy sources. It restricts the construction of new coal-fired power plants, allowing only those already included in the Electricity Supply Business Plan. Nonetheless, the execution of investments and the development of government-mandated renewable energy projects continue to be hindered by various challenges.

The energy transition process faces a significant challenge that has been largely overlooked: gender inequality.[11] This is particularly evident in the limited involvement of women within the renewable energy sector, encompassing roles as decision-makers, technical staff, and beneficiaries. According to data from the International Renewable Energy Agency[12], women represent approximately 32% of the global renewable energy workforce, contrasting with a mere 22% within the conventional energy sector. The disparity in Indonesia is particularly significant, highlighting a systemic underrepresentation within the national energy transition.

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[10] Alloysius Joko Purwanto, *Forecast of Biomass Demand Potential in Indonesia Seeking a Business Model for Wood Pellets* (< bound method Organization. get_name_with_acronym of< Organization …, 2022), https://coilink.org/20.500.12592/f2qq6p.

[11] Cecilia Alda-Vidal et al., "Gender Imaginaries in Energy Transitions: How Professionals Construct and Envision Gender Equity in Energy Access in the Global South," *World Development* 168 (August 1, 2023): 106258, doi:10.1016/j.worlddev.2023.106258; Alya Antasya and Rekha Kersana, "Gender Inequality and Renewable Energy: How Women's Interests and Lack of Participation Leading to Women Marginalization in Renewable Energy in Indonesia," *Journal Of Indonesian Social Science and Humanities (JISSH)* 13, no. 2 (2024): 123–35, https://ejournal.brin.go.id/jissh/article/view/8877; C.O. Henriques et al., "Unveiling the Green Transition and Gender Disparities in the Energy Industry: A Value-Based DEA Cluster Analysis Approach," *Sustainable Futures* 9 (June 1, 2025): 100546, doi:10.1016/j.sftr.2025.100546; I. Murauskaite-Bull et al., *Gender and Energy – the Effects of the Energy Transition on Women* (Publications Office of the European Union, 2024), doi:10.2760/860118; UN Women and UNIDO, *Gender Equality in the Sustainable Energy Transition* (New York and Vienna: UN Women and UNIDO, 2023), https://www.unwomen.org/en/digital-library/publications/2023/05/gender-equality-in-the-sustainable-energy-transition.

[12] IRENA, *Renewable Energy: A Gender Perspective* (Abu Dhabi: International Renewable Energy Agency, 2019).

The report on Gender and Energy in Indonesia presents a notable increase in the representation of women within the energy sector. From 2019 to 2021, there was a noteworthy increase in the representation of women in executive team roles within IDX200 energy companies. Additionally, female CEOs showed a greater tendency to engage other women in production processes. While merely 2% of women occupied executive line positions responsible for commercial operations, their representation in functional (non-commercial) roles increased from 17% to 21% over the same timeframe. In 2021, half of the IDX200 energy companies lacked female representation in executive roles, indicating a significant oversight, given that gender equality correlates with enhanced business performance, innovation, and productivity. Gender disparities manifest distinctly in the mining sector, where women frequently encounter unequal opportunities for career progression and are generally relegated to low-promotion administrative positions. There is a continued presence of unconscious bias against women within mining companies. Initiatives for gender mainstreaming can originate from the highest levels of an organisation, as leadership significantly influences the development of hiring policies across the company. In 2021, 71% of companies with female CEOs had executive teams comprising over 30% women, more than three times the 19% observed in companies led by males.[13]

This disparity is evident at every level of the energy transition—from policy frameworks to on-the-ground implementation—where renewable-energy engineering and construction remain stereotyped as "male domains," resulting in women's persistent underrepresentation.[14] Technical training and certification programs in solar photovoltaics, micro-hydropower, and bioenergy often operate on rigid schedules that neglect women's domestic responsibilities. Meanwhile in clean-energy research and development (R&D), women encounter formidable barriers to research funding and professional networks that are far more accessible to their male peers.[15] As Tapas Bagdi et al.[16] note, gender has become a critical concern in the renewable-energy sector,

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[13] Abyan Hilmy Yafi et al., *Indonesia Energy Transition Outlook (IETO) 2024* (Jakarta: Institute for Essential Services Reform (IESR), 2024), https://iesr.or.id/en/pustaka/indonesia-energy-transition-outlook-ieto-2024/.

[14] Cathi Albertyn et al., *Feminist Frontiers in Climate Justice: Gender Equality, Climate Change and Rights* (Cheltenham, UK: Edward Elgar Publishing, 2023), doi:10.4337/9781803923796; Laura Eberhöfer, "The Role of Women's Networks in the German Energy Transformation" (Medien- und Informationszentrum, Leuphana Universität Lüneburg, 2024), doi:10.48548/pubdata-1367.

[15] Sara Sánchez-López et al., "Tackling Gender Disparities in Energy Research: A Diagnostic Tool for Equality in Research Centres," *Energy, Sustainability and Society* 14, no. 1 (August 23, 2024): 51, doi:10.1186/s13705-024-00479-8.

[16] Tapas Bagdi et al., "Evaluation of Research Progress and Trends on Gender and Renewable Energy: A Bibliometric Analysis," *Journal of Cleaner Production* 423 (October 15, 2023): 138654, doi:10.1016/j.jclepro.2023.138654.

inspiring many studies aimed at overcoming bias and enhancing social outcomes; yet international collaboration remains woefully limited, diminishing the impact of development efforts. Even fewer investigations address the intersection of gender inequality and energy access within developing or least-developed countries, where these dual challenges are most pronounced.

The participation of women in the energy transition extends beyond a call for social justice; it serves as a strategic approach to enhance the quality, sustainability, and acceptance of energy policies.[17] Numerous studies indicate that women's engagement in the planning and execution of energy projects significantly improves the outcomes and sustainability of these programs.[18] The World Bank's Energy Sector Management Assistance Program[19] reveals that community-based energy projects with strong female involvement not only achieve better outcomes and sustain infrastructure more effectively but also advance gender equality by ensuring women's voices in consultations—improving delivery and engagement. Inclusive outreach campaigns and targeted efforts to remove cultural barriers—backed by gender specialists and local partners—help recruit and retain women at every project stage. Greater female representation in utility management drives operational change in the field, while long-term strategies such as promoting girls' STEM education and forging utility-school partnerships strengthen the talent pipeline. Research conducted by IESR[20] in various Indonesian villages

[17] Sanya Carley and David M. Konisky, "The Justice and Equity Implications of the Clean Energy Transition," *Nature Energy* 5, no. 8 (August 1, 2020): 569–77, doi:10.1038/s41560-020-0641-6; Marco Cellini et al., "Exploring the Nexus of Gender and Energy Transitions: A Systematic Literature Review," *Energy Research & Social Science* 119 (January 1, 2025): 103887, doi:10.1016/j.erss.2024.103887; Daniela Lazoroska, Jenny Palm, and Anna-Riikka Kojonsaari, "Gender-Based Opportunity Structure in the Energy Sector: A Literature Review on Women's Networking and Mentoring," *Energy, Sustainability and Society* 14, no. 1 (December 18, 2024): 67, doi:10.1186/s13705-024-00494-9; Marula Tsagkari, "The Need for Gender-Based Approach in the Assessment of Local Energy Projects," *Energy for Sustainable Development* 68 (June 1, 2022): 40–49, doi:10.1016/j.esd.2022.03.001.

[18] Nurshahirah Abd Majid and Amar Hisham Jaaffar, "Social Impact of Renewable Energy Projects: Community Engagement and Stakeholder Management," in *Renewable Energy Projects and Investments*, ed. Hasan Dinçer and Serhat Yüksel (Elsevier, 2025), 117–34, doi:10.1016/B978-0-443-29869-1.00007-6; Elizabeth Cecelski, *The Role of Women in Sustainable Energy Development* (National Renewable Energy Lab.(NREL), Golden, CO (United States), 2000); Oliver W. Johnson et al., "Intersectionality and Energy Transitions: A Review of Gender, Social Equity and Low-Carbon Energy," *Energy Research & Social Science* 70 (December 1, 2020): 101774, doi:10.1016/j.erss.2020.101774.

[19] Maria Beatriz Orlando et al., "Getting to Gender Equality in Electricity Infrastructure: Lessons from Electricity Generation, Transmission, and Distribution Projects," *Energy Sector Management Assistance Program (ESMAP) Technical Report*, no. 012/18 (January 19, 2018), https://openknowledge.worldbank.org/handle/10986/29259.

[20] IESR, *Perempuan Bicara Energi: Akses Energi Bersih Untuk Pemberdayaan Dan Kesetaraan Perempuan Indonesia* (Jakarta, Indonesia: Institute for Essential Services Reform, 2017), https://iesr.or.id/wp-content/uploads/2018/11/COMS-PUB-0002_Briefing-Paper-2_Perempuan-bicara-energi.pdf.

further indicates that the involvement of women in technical training and energy management leads to their emergence as local technicians and energy educators within their communities.

Energy companies in the formal sector that exhibit higher levels of gender diversity demonstrate improved financial performance and enhanced innovation capabilities.[21] A study conducted by McKinsey & Company[22] indicated that organisations with a greater gender diversity in leadership are 25% more likely to achieve above-average profitability. The emerging clean energy sector demonstrates that the involvement of women significantly influences product innovation and fosters more inclusive service strategies, exemplified by the development of energy-efficient stoves and decentralised electricity systems tailored for rural contexts. Integrating women into the entire value chain – from policy formulation to field technicians – not only advances gender equality, but also bolsters the effectiveness and sustainability of energy. Nevertheless, this considerable potential is unexploited primarily because existing policy approaches and programs that fail to account for the entrenched power dynamics and structural obstacles confronting women in this field.

Despite numerous data indicating that the participation of women significantly bolsters the efficacy and sustainability of the energy transition; however, women's perspectives and contributions are frequently marginalised within Indonesia's energy policy formulation. The drafting of strategic documents, such as the Regional Energy General Plan and low-carbon development planning often reflects a superficial inclusion of women, where their participation appears more symbolic than substantive, lacking genuine influence on the outcomes. An IESR[23] report highlights that women remain significantly under-represented in energy discussions. Village-level deliberations remain predominantly male—dominated—even when the agenda concerns energy—notwithstanding the vital necessity of women's participation in decision-making. Given their unique roles and the impacts they bear, this systemic exclusion remains a significant barrier to equitable development. Access to clean energy would not only ease women's daily chores but also empower them to pursue personal development and allocate time to productive activities. At the national level, strategic documents—such as the Electricity

[21] Faozi A. Almaqtari et al., "The Moderating Effect of Board Gender Diversity in the Environmental Sustainability and Financial Performance Nexus," *Discover Sustainability* 5, no. 1 (October 10, 2024): 318, doi:10.1007/s43621-024-00517-7.

[22] Sundiatu Dixon-Fyle et al., *Diversity Wins: How Inclusion Matters* (New York: McKinsey & Company, May 19, 2020), https://www.mckinsey.com/featured-insights/diversity-and-inclusion/diversity-wins-how-inclusion-matters.

[23] IESR, *Perempuan Bicara Energi: Akses Energi Bersih Untuk Pemberdayaan Dan Kesetaraan Perempuan Indonesia*.

Supply Business Plan and energy-pricing policies—rarely incorporate gender considerations into their planning and implementation processes.

The Indonesian Women's Coalition[24] assert that the energy transitions affect gender disparately due to entrenched social roles. Historically, women manage domestic care, food security, and household conditions, whereas men often occupy external breadwinning roles. Consequently, energy scarcity disproportionately compromises women's health, safety, and ability to participate in economic activities and organise effectively. Specifically, reliance on unclean cooking fuels exposes both women and infants to hazardous fumes, significantly increasing children's vulnerability to Acute Respiratory Infections (ARI).

The central argument is that the lack of women's participation does not reflect the insignificance of their contributions, but instead stems from masculine institutional and cultural policy frameworks that overlook women's experiences and perspectives in sectors traditionally governed by technocratic and macroeconomic methodologies. Community-based energy training programs frequently lack customisation to address women's specific needs regarding timing, location accessibility, and curriculum, which consequently restricts their participation due to the program's design. Initiatives like the "Solar Sister" program demonstrate that providing women with access, training, and sufficient institutional support enables them to play crucial roles in local clean energy development.[25] However, these initiatives remain inconsistent and lack integration within a cohesive national policy framework, indicating that women participation has not been regarded as a strategic imperative, but instead has been framed as a normative narrative within formal documents, lacking concrete and measurable implementation mechanisms.

Regarding women domestic responsibilities, including housework, childcare, and fulfilling the family's fundamental needs,[26] This social construct restricts their presence in the public sphere and shapes the design and implementation of energy policies and programs.[27] In

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[24] Koalisi Perempuan Indonesia, "Gender Dan Energi Bersih Terbarukan: Energi Baru Terbarukan Atau Energi Bersih Terbarukan?" (Jakarta, Indonesia: Koalisi Perempuan untuk Keadilan dan Demokrasi, October 15, 2020), https://berkas.dpr.go.id/akd/dokumen/K7-RJ-20201015-102222-4803.pdf; Koalisi Perempuan Indonesia, "SEMAI: Perempuan Dan Energi Terbarukan," December 1, 2019, https://energiterbarukan.org/assets/2019/12/SEMAI-Perempuan-dan-Energi-Terbarukan.pdf.

[25] Leslie Gray et al., "The Power of Small-Scale Solar: Gender, Energy Poverty, and Entrepreneurship in Tanzania," *Development in Practice* 29, no. 1 (January 2, 2019): 26–39, doi:10.1080/09614524.2018.1526257.

[26] Renata Forste and Kiira Fox, "Household Labor, Gender Roles, and Family Satisfaction: A Cross-National Comparison," *Journal of Comparative Family Studies* 43, no. 5 (September 1, 2012): 613–31, doi:10.3138/jcfs.43.5.613.

[27] Kavya Michael and Helene Ahlborg, "A Conceptual Analysis of Gendered Energy Care Work and Epistemic Injustice Through a Case Study of Zanzibar's Solar Mamas," *Nature Energy* 9, no. 8 (August 1, 2024): 947–54, doi:10.1038/s41560-024-01539-1.

numerous instances, despite women being the primary consumers of energy within households, they are seldom included in the decision-making processes regarding the provision, management, or direction of energy in development initiatives.[28] Consequently, women's unique experiences and requirements are frequently neglected in the formulation of energy policies, which subsequently affects the effectiveness and applicability of these policies at the grassroots level.[29]

Marginalisation is perpetuated by institutional frameworks and policies that subtly reinforce the exclusion of women from sectors perceived as technical or strategic, such as energy. Technical training in renewable energy is often organised without considering the dual responsibilities women hold in both domestic and public spheres. These programmes fail to provide essential support systems, such as childcare, limiting women's access. Moreover, the perception of the energy sector as male-dominated discourages women from pursuing roles as technicians, project managers, or innovators. Energy transition programmes that overlook these patriarchal norms risk unintentionally deepening existing inequalities. Therefore, policy solutions must create formal opportunities for women's participation and include specific measures to dismantle the cultural and structural barriers that have historically constrained women's roles in energy transformation.

A significant risk to consider is the potential loss of social innovation capabilities and the implications for long-term sustainability. A study by the International Union for Conservation of Nature[30] indicates that environmental and energy initiatives that include women in leadership and decision-making roles demonstrate enhanced sustainability and adaptability. This trend can be attributed to women's inclination to emphasise a balance between human needs and the preservation of natural resources. In contrast, when the energy transition is approached through a hierarchical and masculine lens, the focus often shifts to exploitative practices, prioritising the attainment of numerical targets while neglecting the essential social dynamics involved. This may lead to social resistance within communities, particularly when implementing energy projects without engaging in inclusive dialogue. Consequently, the exclusion of women adversely affects the individuals involved and undermines the societal structures essential for a just and sustainable energy transition. If not properly managed, this could lead to an energy

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[28] R. Anil Cabraal, Douglas F. Barnes, and Sachin G. Agarwal, "Productive Uses of Energy for Rural Development," *Annual Review of Environment and Resources* (Annual Reviews, 2005), doi:https://doi.org/10.1146/annurev.energy.30.050504.144228.

[29] Koffi Ekouevi and Voravate Tuntivate, *Household Energy Access for Cooking and Heating: Lessons Learned and the Way Forward* (World Bank Publications, 2012).

[30] International Union for Conservation of Nature (IUCN), "New Data Reveals Slow Progress in Achieving Gender Equality in Environmental Decision Making," March 1, 2021, https://www.iucn.org/news/gender/202103/new-data-reveals-slow-progress-achieving-gender-equality-environmental-decision-making.

transition characterised by elitism and a lack of democratic engagement, neglecting the complex crises that is currently confronting in Indonesia.

A specific instance illustrating the impact of women's participation in the energy transition is found in numerous community-based energy initiatives in Indonesia, where women are engaged from the planning phase onward. In Sumba Regency, East Nusa Tenggara, the "Sumba Iconic Island" programme, backed by Hivos, has effectively demonstrated that women can play a crucial role in the management and upkeep of solar power generation systems at both household and village levels. They receive training in technical skills, financial management, and energy education, equipping them to serve their communities effectively.[31] This indicates that women are capable of enhancing the efficiency, sustainability, and inclusivity of renewable energy projects. The participation of women further enhances social resilience, as they tend to be more attuned to matters concerning health, education, and community welfare—elements frequently neglected in transition strategies focused on technology and investment. Women's involvement should be regarded as a core principle in energy governance, encompassing institutional reform, project licensing, and financing mechanisms. Numerous instances at the local level demonstrate that when women are allowed to engage in the energy transition, the outcomes are more sustainable and better aligned with social needs. Nonetheless, this achievement has not been consistently reproduced in the framework of national energy policies due to frequently perceived as anomalies rather than evidence that women's participation is crucial to effective strategies. This prompts a more profound inquiry: given the demonstrated effectiveness of women's participation, what accounts for Indonesia's hesitance to establish it as a fundamental principle?

The formulation of energy policy reveals a significant aspect: it is primarily influenced by a technocratic and macroeconomic framework that, while ostensibly gender-neutral, often exhibits a bias that overlooks women's social needs and roles. The planning and decision-making processes continue to be confined to institutions with historically and structurally demonstrated a lack of gender inclusivity. The presence of women in key institutions, including the Ministry of Energy and Mineral Resources, the National Development Planning Agency, the State Electricity Company, and private energy sector entities is notably insufficient. In a framework governed by technical logic and profitability, social considerations – including gender, are perceived as an extra burden rather than a fundamental driving force. Research

[31] T.E. Lambooy and S. Van 't Foort, "Sumba Iconic Island: A Case Study on Establishing a Community-Public-Private Partnership for Providing Renewable Energy," in *CSR in Indonesia: Legislative Developments and Case Studies*, ed. T.E. Lambooy and A. Kusumadara (Jakarta: Konstitusi Press, 2013), 315–404, https://research-portal.uu.nl/en/publications/sumba-iconic-island-a-case-study-on-establishing-a-community-publ.

conducted IRENA[32] indicates that the effectiveness of energy transition is significantly affected by the fair distribution of benefits, including women's active participation. This situation prompts several inquiries: Is our energy institutional framework adequately positioned to undergo reforms that enhance its democratic and gender-equitable nature? What factors contribute to the persistence of gender bias in energy policies in Indonesia, resulting in the exclusion of women's voices and interests? And What measures should be implemented to guarantee this transformation is equitable, inclusive, and sustainable?

B. Gender Bias in Indonesia's Energy Transition Policies: Addressing Inequities for Sustainable Change

Haningrum Eka Putri Rahayu[33] articulated that greenhouse gas emissions linked to energy production become the primary driver of climate change, and the Paris Agreement, established in 2015, functions as a framework for nations to collaboratively tackle this challenge by restricting the increase in global temperatures to below 2°C. To accomplish this objective, Article 4(2) of the Paris Agreement mandates that member countries formulate Nationally Determined Contributions (NDCS) and execute mitigation strategies, with the shift to renewable energy representing a crucial advancement. Renewable energy demonstrates a significant reduction in emissions across its entire life cycle when compared to fossil fuels. This capability facilitates nearly complete decarbonisation within the power generation sector and contributes to lower emissions in the transportation and industrial sectors. To achieve a fair and inclusive energy transition, increasing the participation of women, as they are frequently marginalised in male-dominated energy sectors is required. Strategies must be designed to prioritise gender equality and eliminate stereotypes, while guaranteeing equal access to resources and opportunities for decision-making. The ASEAN Action Plan for Energy Cooperation (APAEC) in the ASEAN region focuses on integrating a fair and inclusive energy transition, highlighting the significance of energy security while promoting the acceleration of decarbonization efforts.

In Indonesia, the National Energy General Plan outlines a definitive trajectory for the transition towards renewable energy. The framework mandates that new and renewable energy sources are expected to account for 23% of the national primary energy mix by 2025, with this

[32] IRENA, *Renewable Energy: A Gender Perspective*.

[33] Haningrum Eka Putri Rahayu, "Women at the Heart of a Just and Inclusive Energy Transition: The Importance of Gender-Responsive Energy Policies," *ASEAN Climate Change and Energy Project: Phase 2 (ACCEPT II)* (ASEAN Climate Change and Energy Project (ACCEPT), March 20, 2025), https://accept.aseanenergy.org/women-at-the-heart-of-a-just-and-inclusive-energy-transition-the-importance-of-gender-responsive-energy-policies.

target ascending to 31% by 2050. However, as of 2024, the proportion of new and renewable energy within the primary energy mix is approximately 13.1% – significantly below the interim target.[34] This suggests that intensified actions are still critically required to guarantee the transition unfolds as intended. Despite the strategic importance of these achievements, the integration of gender-responsive policies remains insufficient. The development of renewable energy policies in Indonesia continues to overlook the pivotal role of women, largely due to entrenched structural, social, and cultural factors. Initially, the sector is hampered by the several factors. A societal belief that energy and natural resources predominantly belong to men, particularly in the realms of technical and managerial roles. This results in disparities that hinder women's involvement in energy-related decision-making processes. In numerous cultures, the domain of energy, encompassing natural resource management and power generation, is frequently perceived as an area necessitating technical expertise that is often attributed more to men. This perspective fails to recognise the significant contributions women can make in this sector, instead relegating them to the status of mere energy consumers, rather than acknowledging their potential as managers or decision-makers in energy use and distribution.

Moreover, the lack of female representation in renewable energy policy-making can be correlated to prevailing gender disparities within both the government and industry sectors. The labour force data in the energy sector indicates that women frequently do not receive adequate recognition in strategic and leadership positions. While Indonesia has implemented various policies to promote women's empowerment across different sectors, women's representation in high-level positions that significantly impact policy formulation remains limited. Consequently, their capacity to exert strategic influence over high-level policy formulation remains limited.

Another factor involves the stereotypes that assign women as the role of managing domestic affairs, such as overseeing households and caring for families, while perceiving the energy sector as predominantly technical and business-focused. Renewable energy policies formulated within this framework often overlook the significant contributions of women at both the household and community levels, despite their crucial role in managing energy for daily necessities. The perception that women are not recognised as key contributors to the energy transition obstructs their involvement in developing policies for energy sustainability. This

[34] Alvin Putra Sisdwinugraha et al., *Indonesia Energy Transition Outlook 2025* (Jakarta: Institute for Essential Services Reform (IESR), December 12, 2024), https://iesr.or.id/download/indonesia-energy-transition-outlook-2025/.

viewpoint relegates their role to managing household energy, which is often viewed as less significant and lacking direct influence on broader energy systems.

Furthermore, current policy frameworks often disregard participatory methods that engage all segments of society, including women. Numerous renewable energy policies are developed by a predominantly male elite who may lack a comprehensive understanding of, or appreciation for, the contributions of women in everyday life, particularly regarding energy consumption. Policies of the National Renewable Energy Action Plan and the 35,000 MW Program emphasise large-scale projects that require advanced technology and significant investments.[35] These initiatives predominantly engage men in technical and decision-making capacities, resulting in a lack of active female participation throughout all phases, from planning to implementation.

The tendency of renewable energy policies to marginalise women's involvement is intrinsically correlated to the existing disparities in access to specialised education and training within the energy field. Many women in Indonesia, particularly in rural regions, face disparities in access to sufficient education, which hinders their ability to engage in the renewable energy sector, encompassing both technical and managerial dimensions.[36] Their underrepresentation in this sector can be attributed to gender discrimination and insufficient support aimed at enhancing women's skills and capabilities in areas related to renewable energy. These failing policies contribute to the persistence of gender inequality and limit their opportunities to engage in this growing field.

The lack of female representation in the development of renewable energy policies indicates a disconnect between current policies and the actual requirements observed in practice. Women, particularly in rural regions, frequently comprehend their household energy requirements more profoundly and can offer valuable perspectives on more efficient and sustainable energy usage methods. Nonetheless, the inadequacy of renewable energy policies in women result in a frequent oversight of their needs regarding access to and management of renewable energy. Consequently, current policies demonstrate diminished effectiveness in developing energy solutions that adequately address the needs of all stakeholders, particularly concerning women's empowerment within households and communities. The marginalisation of women in this formulation arises not only from social and cultural factors but also from the

[35] Indra A. Aditya, Tito Wijayanto, and Dzikri F. Hakam, "Advancing Renewable Energy in Indonesia: A Comprehensive Analysis of Challenges, Opportunities, and Strategic Solutions," *Sustainability* 17, no. 5 (2025): 2216, doi:10.3390/su17052216.

[36] Jenny Yi-Chen Han et al., *State of Gender Equality and Climate Change in ASEAN* (Jakarta, Indonesia: ASEAN; UN Women, 2022), https://asean.org/wp-content/uploads/2022/08/State-of-Gender-Equality-and-Climate-Change-in-ASEAN_FINAL-1.pdf.

inherent structure of the policies, which inadvertently positions women in a marginal role. Energy policies that overlook the contributions of women in energy management, both within households and in strategic decision-making roles, impede the progress towards a sustainable and inclusive energy transition. Continuing these policies without modification will pose significant challenges to achieving a just energy transition.

Women can significantly influence outcomes in tangible ways. An illustrative case of how women can enhance the effectiveness of the energy transition in Indonesia is evident in an initiative in Batu Menyan Village, Lampung. In this village, women serve as both beneficiaries of renewable energy and key figures in overseeing the transition process by founding a solar panel-based energy cooperative. This engages women in technical management, finance, and community education, effectively linking the technical dimensions of the energy transition with the social and domestic requirements of their community. The strategy employed by women has demonstrated a greater capacity to respond to practical circumstances. By tailoring energy distribution schedules to correspond with household routines and local consumption trends, these approaches address critical nuances that are frequently neglected by top-down, hierarchical energy policies and initiatives. A report by Coaction Indonesia indicates that the success of women's involvement in Batu Menyan illustrates that an inclusive approach enhances community acceptance of renewable energy while reinforcing the project's technical and social sustainability.[37] This fact highlights the necessity of crafting energy transition policies and implementations that intentionally recognise women as active change agents. They should not be viewed merely as symbols of participation, but rather as possessors of essential knowledge and important experience for the success of energy transformation at the grassroots level.

Indonesia's energy transition policies that exhibit gender bias are not isolated phenomena; instead, they are the result of a longstanding historical context of energy governance shaped by patriarchal and technocratic power dynamics. This bias manifests across multiple dimensions, including policy formulation, stakeholder engagement, and benefit distribution. It is grounded in theoretical and philosophical frameworks that systematically marginalise women in development, particularly within the energy sector, which is often perceived as a masculine domain.

[37] Dwi Tamara, "Penguatan Peran Perempuan Perdesaan Dalam Mewujudkan Transisi Energi Berkeadilan," *Coaction Indonesia* (Jakarta, Indonesia: CoAction, Oktober 2024), https://coaction.id/penguatan-peran-perempuan-perdesaan-dalam-mewujudkan-transisi-energi-berkeadilan-2/.

Gender bias in energy transition policies can be understood through a gender and development framework that differentiates between practical and strategic gender needs. In various energy policies in Indonesia, including the National Energy Plan and the Electricity Supply Business Plan, women's practical needs are recognised, such as access to household electricity and the distribution of liquefied petroleum gas. However, their strategic needs—encompassing participation in decision-making, control over resources, and influence on policy direction—remain inadequately addressed systematically. This generates a perception that policies are supportive of women, while in reality, they continue to be treated as objects rather than active participants in the energy transition.

Moreover, feminist institutionalism elucidates those formal institutions, including ministries, state-owned enterprises, and donor agencies, are influenced and operated according to masculine norms and practices that lack gender neutrality.[38] The prevailing norms, including the belief that energy decisions should prioritise economic rationality and technical efficiency, inadvertently marginalise knowledge and values that are more relational and contextual, frequently related to women's experiences. This highlights the tendency of significant forums, such as the Just Energy Transition Partnership roadmap to exclude women's organisations as strategic stakeholders, despite their direct impact from shifts in the energy landscape.[39]

Examining this issue through the lens of political philosophy reveals that the bias originates from the historical context of modern positivism and liberalism, which conceptualise public policy as an impartial and universally applicable process. In this context, decisions deemed objective rely on macroeconomic data, technical simulations, and logical analysis. Nevertheless, as critics by Iris Marion Young[40] have highlighted, this approach tends to obscure the dynamics of unequal power relations. It overlooks the variations in identity and social experience, particularly regarding gender. The formulation of energy policies within this epistemological framework tends to marginalise women's voices while reinforcing male dominance in decision-making, which is often regarded as a standard professional practice.

This gender bias is evident in the composition of institutions and the processes involved in policy-making. In the organisational framework of the Ministry of Energy and Mineral Resources, and in state-owned energy companies such as those in the Liquefied Petroleum Gas

[38] Meryl Kenny, "A Feminist Institutionalist Approach," *Politics & Gender* 10, no. 4 (2014): 679–84, doi:10.1017/S1743923X14000488.

[39] JETP, *JETP Comprehensive Investment and Policy Plan* (Jakarta, Indonesia: JETP Indonesia, November 15, 2023), https://jetp-id.org/storage/official-jetp-cipp-2023-vshare_f_en-1700532655.pdf.

[40] Iris Marion Young, *Intersecting Voices: Dilemmas of Gender, Political Philosophy, and Policy* (Princeton University Press, 1997).

(LPG) sector, strategic roles continue to be overwhelmingly occupied by men. Laksmita Dwi Hersaputri[41] points out that since the Industrial Revolution was fuelled by coal and later by other fossil fuels, the energy sector has relied on physically demanding work in remote, hazardous places—roles traditionally held by men. Even today, while women make up about 40% of the global workforce, they account for only 22% of jobs in oil and gas and 32% in clean energy, with leadership roles being even rarer. Indonesia's figures reflect this global trend: although women represent about 40% of the overall workforce but hold just 20–30% of positions in major energy companies and the Energy Ministry. Perhaps most telling is that women occupy only 17% of the seats on the parliamentary commission responsible for energy oversight. This persistent underrepresentation—especially in technical and decision-making roles—stems from social norms that pressure women to leave work for motherhood, a lack of family-friendly policies and facilities, limited access to technical training, and the absence of affirmative-action policies in the energy sector, unlike in education or health.

The energy policies in Indonesia exhibit gender bias that is intricately connected to prevailing social and cultural frameworks. These frameworks assign women to manage domestic responsibilities and household energy use while excluding them from participation in technical and strategic domains, such as electricity grid design, technology selection, and energy investment planning. Women significantly contribute to daily energy practices as users, managers, and innovators within their communities. However, this information is often excluded from policy assessments as it is considered "unprofessional" or "irrelevant." Consequently, energy transition policies that exhibit gender bias frequently result in initiatives that fail to address the needs and roles of women.

Community solar power projects in various villages in East Nusa Tenggara and West Nusa Tenggara frequently struggle to maintain sustainability due to the lack of women's participation in technical training and post-installation management, despite their role as the primary users. This highlights a recurring pattern of exclusion, where failures in participation are interpreted as technical shortcomings, even though they originate from inherent biases in the design of the participatory process. This increases evident in policies that favour large-scale, capital-intensive technology-driven solutions, which are often implemented through top-down approaches. Such models depict communities, including women, as passive recipients instead of recognising them

[41] Laksmita Dwi Hersaputri, "Fuelling Progress to Parity: How Indonesia Can Close the Gender Gap in Energy," *Economic Research Institute for ASEAN and East Asia (ERIA)* (Economic Research Institute for ASEAN and East Asia (ERIA), March 8, 2025), https://www.eria.org/news-and-views/fuelling-progress-to-parity--how-indonesia-can-close-the-gender-gap-in-energy.

as active subjects capable of contributing to energy technologies' design, utilisation, and maintenance. Numerous studies indicate that community-based approaches that facilitate greater women's participation tend to achieve higher levels of long-term sustainability, both in social and technical aspects. However, this potential remains underutilised due to its misalignment with the prevailing policy framework.

Gender bias in energy policy further illustrates the underlying power dynamics: it highlights the criteria for expertise, the allocation of platforms for expression, and the selection of individuals tasked with influencing future directions. In these structures, male dominance is reflected in representation statistics and the perception of energy as a technical, rational, and economically growth-focused pursuit. This perspective has historically and philosophically side-lined relational, social, and everyday aspects frequently associated with women's contributions. When these frameworks guide policy, the energy transition becomes an infrastructure agenda instead of a broader social transformation.

Therefore, gender bias in energy transition policies should not be considered a trivial anomaly within a fundamentally neutral framework. Conversely, it stems from a system not constructed to incorporate women's viewpoints and experiences. The maintenance or reproduction of disparities in representation, participatory exclusion, and disregard for women's experiences through policy instruments indicates that gender bias is not just an incidental outcome but rather a systematic and structured phenomenon. Energy transition policy reform is essential to achieve decarbonisation targets, especially for social justice, necessitating an examination of the underlying factors contributing to gender inequality within national energy governance. To address this bias, acknowledging that energy policy operates not as a neutral technical domain but as a political arena that necessitates negotiation among various values, interests, and lived experiences is crucial. The absence of courage to transform paradigms and create opportunities for women's epistemologies will result in a sustainable and equitable energy transition that remains unequal and exclusive.

C. A Gender-Blind Transition: Critical Reflections on Indonesia's Draft Law on Renewable Energy

The Commission on Violence Against Women outlines various laws and regulations in Indonesia concerning women and energy and Regulation No. 11 of 2023 emphasises integrating gender considerations into national development. The Long-Term Strategy for Low Carbon and Climate Resilience 2050 also acknowledges the necessity for inclusive participation from all

stakeholders, particularly vulnerable groups and women. In the examination of various laws, regulations, and policies about the energy sector, particularly within the geothermal sub-sector, it is notable that the term "gender" is absent, as are references to "gender equality" or "women." Its terminology is limited to "local community" or "local people" as evidenced in Law No. 21 of 2014 on Geothermal Energy, Government Regulation No. 7 of 2017 on Geothermal Energy for Indirect Utilisation, Presidential Regulation No. 112 of 2022 on Accelerating the Development of Renewable Energy for Electricity Supply, and Ministerial Regulation No. 50 of 2017 on the Utilisation of Renewable Energy Sources for Electricity Supply.[42]

Based on the realities above, it can be inferred that women's rights and gender equality are assured at the ideological level, which is established in both international and national legal frameworks. In the energy sector, specifically within the geothermal sub-sector, there appears to be a lack of consideration for women's rights and gender equality. Women encounter various vulnerabilities in natural resource conflicts, especially concerning new and renewable energy, which encompass physical, non-physical, sexual, and social violence. Geothermal drilling generates vibrations and significant noise levels, contributing to heightened anxiety within communities, particularly among women.

Furthermore, the depletion of water sources exacerbates the challenges faced by women. At the same time, women farmers reliant on agricultural land and rivers for their livelihoods have experienced a significant loss of their income sources. Consequently, various factors have been suggested for consideration in the energy transition policies development. These include: the necessity for a gender impact analysis for each policy; the importance of disaggregated data to facilitate inclusive policy design; the women inclusion in decision-making processes; the provision of representation and leadership training for women; the assurance of equal economic access and employment opportunities within energy transition projects; as well as the need to address and mitigate any negative impacts on women—education and awareness regarding gender issues; partnership with women's organisations.

Efforts transition to net-zero emissions necessitate thoroughly identifying energy resources, infrastructure, technologies, and suitable financing allocations. The availability of skilled and qualified human resources at every stage of energy projects is paramount. Human resource development has been identified as a key national priority program. The Ministry of

[42] Komnas Perempuan, "Memperkuat Perspektif Gender Dalam Kebijakan Transisi Energi Di Indonesia" (Jakarta, Indonesia: Komisi Nasional Anti Kekerasan terhadap Perempuan, April 30, 2025), https://komnasperempuan.go.id/kabar-perempuan-detail/memperkuat-perspektif-gender-dalam-kebijakan-transisi-energi-di-indonesia.

Women's Empowerment and Child Protection, in collaboration with the Institute for Essential Services Reform (IESR), carried out two studies in 2017 focusing on gender integration within the new and renewable energy sector, as well as establishing guidelines for gender integration in accessing special allocation funds for the development of small-scale power plants. These findings suggest that although there is a great deal of gender and inclusion considerations in renewable energy policies, putting these ideas into practice remains a significant challenge. Consequently, aligning gender and inclusion indicators with operational activities is essential. Failure to address this issue will result in ongoing disparities and exclusion.

At present, alongside multiple national energy regulations, the government has formulated a national energy policy and established a national energy master plan. The plans constitute a crucial component of the national medium-term development strategy and have been aligned with the metrics necessary for attaining sustainable development objectives, especially goal seven concerning energy. The Indonesian House of Representatives has engaged in discussions regarding a draft law on new and renewable energy, which was not approved in the previous legislative period, thereby designating it as a priority for the current session.

The proposed new and renewable energy legislation is part of the National Legislation Program for Draft Laws from 2025 to 2029. It is also included among the 41 Priority National Legislation Programs for Draft Laws in 2025. This inclusion is aligned with the vision and mission of the elected President and Vice President, Prabowo-Gibran: "Together with Indonesia, Advancing Towards a Golden Indonesia in 2045." The Astacita framework is built upon eight core missions designed to transform the nation, namely: 1) Ideology and Rights by strengthening the foundation of Pancasila, democracy, and human rights; 2) Security and Self-Sufficiency by consolidating national defence while driving independence through self-sufficiency in food, energy, and water, alongside the growth of the creative, green, and blue economies; 3) Economic Opportunity by creating higher-quality employment, encouraging entrepreneurship, developing innovative industries, and continuing infrastructure development; 4) Human Capital and Equality by prioritising development in science, technology, education, and healthcare, while championing gender equality and the empowerment of women, youth, and people with disabilities; 5) Industrial Growth with a commitment to downstreaming and industrialisation to increase domestic value addition; 6) Grassroots Development by building from the village level upwards to tackle poverty eradication and ensure economic fairness; 7) Institutional Reform by modernising the bureaucracy and legal system, with a firm focus on eradicating corruption and drugs-related issues; and 8) Social and Environmental Harmony by aligning national life with

nature and culture, while increasing religious tolerance to achieve a just and prosperous society.[43]

The establishment of laws should rest on three critical pillars: philosophical, sociological, and juridical foundations. The intellectual foundation addresses essential concepts related to the core substance of the legislation to be enacted and the objectives of the state. It emphasises the state's duty to safeguard the community, the nation, and the fundamental rights of citizens as articulated in the 1945 Constitution, including both the Preamble and the Main Body. The sociological foundation addresses empirical evidence related to advancements in the area requiring regulation, while also considering the societal issues and needs that arise concurrently. The legal foundation addresses matter about the substance or content of the rules. The legal issues identified include the lack of established norms governing specific areas, outdated regulations that fail to align with societal advancements and requirements, as well as the inconsistency or overlap of norms with subordinate regulations, which ultimately undermines their enforceability. Philosophical considerations focus on the normative side of the constitution – essentially, the '*das sollen'* or how things ought to be in an ideal sense. In contrast, sociological considerations deal with the '*das sein*', or the practical reality. These are derived in empirical evidence, scholarly research, and direct observations of how society actually functions.

In contrast, legal considerations stem from analysing and evaluating existing laws and regulations, forming their own set of abstractions. The philosophical, sociological, and legal foundations are systematically integrated and manifested in the provisions of a law. The formulation and systematisation of the provisions sequentially incorporate the essence of the philosophical, sociological, and legal foundations, serving as the basis for the development of the law.

Establishing the Law on New and Renewable Energy can be viewed as a strategic response aligned with the state's objective of enhancing the welfare of the Indonesian populace. The provisions outlined in Article 33, paragraphs (2) and (3) of the 1945 Constitution establish the state's obligation to pursue welfare for its citizens. According to Article 33, paragraphs (2) and (3) of the 1945 Constitution of the Republic of Indonesia, the state exercises control over branches of production that are essential for the nation and that govern the basic needs of the populace. Additionally, the article indicates that the state regulates the earth, water, and the natural resources within, aiming to maximise the prosperity of the populace. New and renewable

[43] Bismar Harris Satriawan et al., "Politainment in the 2024 Indonesian Presidential Election and Positioning in Downstream Industry," *Frontiers in Political Science* 6 (2025): 1494578, doi:10.3389/fpos.2024.1494578.

energy, recognised as a strategic natural resource, is a crucial commodity that influences the livelihood of individuals. The state needs to manage this resource effectively to maximise benefits for the prosperity and welfare of the population.

As the world's largest archipelagic nation, Indonesia boasts a rich cultural tapestry and vast natural resources spanning the energy, agriculture, forestry, fisheries, and tourism sectors. However, the current energy mix remains heavily reliant on fossil fuels, which accounted for 94.3% of the country's energy needs in 2013, compared to just 5.7% from renewable sources. Furthermore, declining domestic crude oil production—falling from 945,000 barrels per day in 2012 to 789,000 in 2014—has resulted in nearly half of the supply being imported.

This situation poses a significant risk to national energy security, necessitating implementing policies prioritising justice and sustainability. To prevent the rapid depletion of reverses, it is essential to restrain oil and gas extraction targets while maximising the potential of new and renewable energy sources. Current potentials include 450 MW micro-hydro, 50 GW of biomass, 4.80 kWh/m²/day of solar energy, 3–6 m/sec of wind energy, and 3 GW of nuclear energy. This approach aligns with Presidential Regulation No. 5 of 2006, which aims for a 17% contribution from new and renewable energy by 2025. This involves a projected $ 13.2 billion investment to expand capacities across micro-hydro power plants (2,846 MW), biomass (180 MW), wind (0.97 GW), solar (0.87 GW), and nuclear (4.2 GW). The development strategy encompasses the incorporation of agricultural and forestry waste for biomass, commercialising solar power through private and banking sectors partnership, and fostering international collaboration for nuclear energy, all while ensuring a transition that is both equity and sustainability.

Numerous laws and regulations oversee the domain of new and renewable energy. Article 4 of the Energy Law specifies that the state regulates new and renewable energy resources, ensuring their utilisation for the maximum benefit of the populace. Additionally, Article 20(5) and Article 21 of the Energy Law outline the regulations governing the provision of energy from new and renewable sources by business entities, permanent business entities, and individuals. These parties may be eligible for facilitation and/or incentives from the Government and/or local governments by their authority for a designated period until they attain economic viability. These responsibilities concerning the improvement of new and renewable energy utilisation – along with the engagement of business entities, permanent business entities, and individuals in utilizing energy from these sources – may be supported by facilitation and/or incentives provided by the Government and/or local governments, in line with their respective authorities, for a designated

timeframe until economic viability is attained. The Energy Law effectively addresses about the advancement of new and renewable energy sources, the current regulatory landscape remains scattered across various statuses. These include Law No. 30 of 2007 on Energy, Law No. 30 of 2009 on Electricity, and Law No. 21 of 2014 on Geothermal Energy. To support these, a series of implementing regulations have been introduced, such as Presidential Regulation No. 79 of 2014 regarding the National Energy Policy and Presidential Regulation No. 22 of 2017, which details the National Energy Master Plan; and Minister of Energy and Mineral Resources Regulation No. 39 of 2017, which governs the execution of physical activities related to the utilisation of new and renewable energy and conservation. However, this legal is fundamentally fragmented. Because the current rules are spread across multiple levels of government and subject to frequent amendments, they fail to provide a stable or certain legal foundation. Consequently, the lack of a single, comprehensive law creates a sense of regulatory instability. To rectify this, it is essential to establish a distinct, dedicated new and renewable energy law that can serve as a legal foundation and a reference point for subordinate regulations.

Furthermore, the existing regulations remain dispersed across various statutes that frequently lack cohesion and are subject to continual amendments. As a result, they fail to establish a comprehensive legal foundation and do not ensure legal certainty. In this context, the necessity for distinct regulations via a separate law has become increasingly pressing. This law is anticipated to serve as the primary legal framework that provides comprehensive regulation and acts as a reference point for subordinate regulations. Implementing New and Renewable Energy in the Law is grounded in several critical principles, including benefit, efficiency, economic justice, sustainability, resilience, sovereignty and independence, accessibility, participation, and integration.

The implementation of New and Renewable Energy aims to achieve national energy security, independence, and sovereignty. By gradually phasing out non-renewable fossil fuels, this transition lays the foundation for environmentally sustainable development while contributing to national economic growth. This draft law seeks to promote the advancement and strengthening of national industry and trade by harnessing clean energy and enhancing the nation's competitiveness at national, regional, and international levels. Emphasising efficiency and effectiveness in energy supply is critical, serving not only as an energy source but also as a raw material for domestic needs. The framework prioritises public access, the enhancement of the added value of energy resources, and ensures the effectiveness of their utilisation and

oversight. To guarantee success, these controls must be managed through transparent, competitive mechanisms that foster efficiency.

This implementation aims to generate new employment opportunities and enhance the welfare and prosperity of the population in a just and equitable way to address and adapt to global climate change. This draft law presents a well-structured compilation of essential elements, addressing principles and objectives, control and management, transition period and road map, energy sources, licensing and exploitation, energy supply and utilisation, environmental management, occupational safety and health, research and development, energy prices, incentives, renewable energy funds, guidance and supervision, along with public participation and sanctions.

Regarding resource management, new and renewable energy are classified as strategic natural resources designated as national property under state control via policy formulation, regulatory frameworks, administrative processes, management strategies, and supervisory mechanisms. This draft law further delineates the framework for energy financing through multiple mechanisms, such as the State Revenue and Expenditure Budget, the Regional Revenue and Expenditure Budget, levies on fossil fuel exports, carbon trade funds, renewable energy certificate funds, and other authorised sources. The responsibility for development and supervision is jointly held by the Central Government and Regional Governments, aligned with their respective authorities, to guarantee sustainable, structured, and accountable energy implementation.

Public participation plays a crucial role in implementing New Energy and Renewable Energy. It can engage in multiple phases, offering insights on policy direction, lodging objections to enacted policies, and contributing to provision, research, development, and energy utilisation initiatives. Its involvement extends to monitoring and assessing the execution of policies and regulations. In practice, the public possesses the right to access information from the government, benefit from energy business activities, and secure employment opportunities arising from the development of this sector. This aligns with the principle of "participation," highlighting the significance of engaging all societal levels, including gender representation of national energy security development. Engaging the public actively enhances accountability and guarantees that the transition to sustainable energy is genuinely inclusive and equitable from a social perspective.

The House of Representatives discusses the Draft Law on New and Renewable Energy, which aims to establish a comprehensive legal framework for developing policies, management,

provision, and utilisation. This framework ensures that implementation is organised and guided from the national to the regional level. The aim is to expedite the advancement of new and renewable energy sources to supplant fossil fuels as the primary energy provider for industrial and power generation requirements. This intends to establish the New and Renewable Energy Bill as an official legal framework that delineates the key aspects of the transition to clean energy. Upon examining the draft bill alongside the Academic Paper from January 25, 2021, it becomes evident that multiple significant issues are present in the draft of Renewable Energy Bill that does not adequately reflect or address the aspirations and needs of the community, particularly concerning women and those in remote areas, along with gender approaches. Energy significantly influences various aspects of women's lives, particularly household activities that can impact both productivity and overall quality of life. Using energy sources that generate significant emissions and contribute to environmental pollution can adversely affect health, particularly in isolated regions. Historically, women have been viewed largely as mere energy consumers. However, it is essential to recognise their capacity to serve as energy producers and independent resource managers, Consequently, the Indonesian Women's Coalition is urging the government and the House of Representatives to recognise women's role as key contributors to energy production. There is also a clear demand for policies that prioritise affordable, decentralised renewable over a continued reliance on fossil fuels and nuclear power.

Dian Kartikasari indicates that there are distinct responsibilities assigned to women and men in the traditional social division. Traditionally, women have been assigned the role of managing household tasks, which include cooking, washing, ironing, cleaning, and childcare. In contrast, men have typically been tasked with earning a living through work outside the home. In executing these domestic responsibilities, women engage directly with energy requirements, specifically the use of fire energy for cooking and electricity for supplying water, illumination, and the functioning of various household devices. This energy accessibility will influence women's health and societal roles. Women utilising firewood for cooking exhibit a higher likelihood of experiencing acute respiratory infections (ARI) than those using biogas for their cooking needs. Women with access to electricity and electronic appliances can complete their household chores more efficiently, allowing ample time for rest and community engagement.[44]

In contrast, women who undertake all their household chores without the assistance of electronic appliances expend greater energy and time to accomplish their tasks, and they may also incur higher expenses than those who have access to energy resources. Women lacking

[44] Koalisi Perempuan Indonesia, "SEMAI: Perempuan Dan Energi Terbarukan."

access to energy, particularly new and renewable sources, incur higher costs to fulfil their household requirements. Furthermore, they lack adequate opportunities to rest, maintain a healthy lifestyle, and engage socially with their environment. These aspects are fundamental resources for women's empowerment. Consequently, the evidence indicates that reduced access to energy for women, particularly in the new and renewable energy realm, correlates with diminished opportunities for enhancing women's empowerment.

Women have an important role beyond merely being users and beneficiaries of new and renewable energy. Certain of them have the ability to construct new and renewable energy systems, effectively producing electricity and heat from biogas to satisfy their household requirements. This evidence indicates that they are capable of contributing to the advancement of new and renewable energy sources. It is noteworthy that women's involvement in the advancement of new and renewable energy is frequently neglected. The development of their installations and utilisation fail to consider their specific needs , resulting in their inability to fully benefit from advancements in this sector. Enhancing women's involvement in the new and renewable energy is essential for reducing their socio-economic vulnerability and easing their domestic burdens. However, this requires more than just a seat at the table. To ensure their needs are truly addressed during decision-making, women must first be empowered to identify and advocate for their own interests. Simply boosting attendance numbers without this groundwork will not effectively enable to express meaningful representation or genuine influence. Gender mainstreaming in the development of new and renewable energy involves examining the implications of existing inequalities in energy access and the limited involvement of women in this sector. The disparity in access and the limited participation of women will lead to an underrepresentation of women in decision-making roles, resulting in missed opportunities for women to benefit from advancements in new and renewable energy development.

The Indonesian Women's Coalition efforts to influence policy are based on actual data collected from the field, especially emphasising the experiences of women and other marginalised groups about new and renewable energy. One crucial viewpoint is examining women's access to new and renewable energy knowledge and skills. Drawing from field experience, it is clear that many women, especially those connected with the Indonesian Women's Coalition, are unaware of new and renewable energy and do not recognise the resources in their surroundings. The Indonesian Women's Coalition encourages members to examine and identify the possibilities in their surroundings and participate in outreach and forums. The results of this mapping are encouraging since they show considerable untapped

potential, especially regarding spent cooking oil. Traditionally, both kerosene and firewood have been utilised as fuel sources; leftover cooking oil offers an option. The required tools are not specific and can use kerosene burners, which are usually used for kerosene consumption.[45]

The second point is on women's participation in the development of policies and the decision-making processes, especially in the renewable energy industry. Starting at the village level, discussions should include initiatives led by women for the advancement of renewable energy. Rural locations offer chances that can be turned into businesses run by the local community. Third, the benefits of energy development and the progress of new and renewable energy sources should be evaluated by considering several key questions: 1) to what extent do these development benefit women and other vulnerable populations, and how positive are the outcomes?; 2) can the expansion of new and renewable energy reduce gender-based inequality, particularly among women?; 3) consider a village that utilises a waterfall to produce electricity, with improved street lighting at night, will women feel safer travelling? Since the community is no longer dependent on the state-owned energy provider and has its power source, hence electricity access is more secure. This can help women running home-based companies improve efficiency and increase family earnings. Overtime, could these economic improvements also contribute to reducing domestic violence?; and 4) what tools are available to ensure women can oversee and participate in t the implementation of these policies?

In addition to other central energy regulations, the government has established a national energy master plan and a national energy strategy. These frameworks, particularly Goal 7 (affordable and clean energy), are essential components of the national medium-term development plan as they align with the indicators for achieving the Sustainable Development Goals. Although the Indonesian House of Representatives previously prioritised a draft law on new and renewable energy, it was not passed in the last parliamentary cycle. As a women's group, the Indonesian Women's Coalition emphasises the importance of active participation in these processes. Current policies are being implemented, and discussions are ongoing regarding proposed new and renewable energy legislation. Among the regions that have developed province-level energy plans is Central Java Province, which has also incorporated strategies for expanding the energy industry into its Regional Medium-Term Development Plan. These plans aim to align with sustainable development goals and the vision presented by President Joko

[45] Ibid.

Widodo during his previous term, in which women are recognised as key development stakeholders and tasked with overseeing the implementation of every policy.[46]

The Indonesian Women's Coalition is writing a position paper focusing on women and new and renewable energy. This paper serves as a foundation for policy papers, enabling lobbying activities and hearings with Commission VII of the Indonesian House of Representatives, as well as relevant ministries and agencies. It was developed with contributions from several NGOs working on new and renewable energy, including the Institute for Essential Services Reform, *Rumah Energi*, and the People's Business and Economy Initiative, alongside insights from the National Research and Innovation Agency. The paper is being supported by the Indonesian Consumers Foundation, which operates women's centres to promote women's rights as consumers. It highlights the importance of integrating new and renewable energy into future planning and implementation to improve community welfare – particularly by reducing gender-based violence and strengthening economic well-being. The Indonesian Women's Coalition still emphasises gender inequity, which impacts women and other vulnerable populations, in the planning, supporting policies, and maintaining new and renewable energy networks.[47]

According to Choris Satun Nikmah[48], Indonesia has ratified the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), which governs the abolition of discrimination against women in all contexts. To achieve gender equality and eradicate discrimination in various professions, women should always be considered in national development and policy, that is highly pertinent regarding resilience, sustainability, and national energy sovereignty.

D. Feminist Energy Justice in Indonesia: Beyond Participation toward Structural Transformation

Shannon Elizabeth Bell et al.[49] indicate that implementing "gender mainstreaming," which prioritises women's interests in urban planning, produces beneficial outcomes while simultaneously revealing limitations in feminist energy initiatives. This indicates that addressing the requirements of pedestrians using baby strollers—a group that frequently encompasses, but is

[46] Ibid.
[47] Ibid.
[48] Choris Satun Nikmah, "Perempuan Dan Energi Terbarukan: Erat Yang Luput Dari Perhatian" (Jakarta, Indonesia: Indonesian Parliamentary Center), 2022), https://energihijau.openparliament.id/wp-content/uploads/2023/02/Buletin-5-Peran-Perempuan-1.pdf.
[49] Shannon Elizabeth Bell, Cara Daggett, and Christine Labuski, "Toward Feminist Energy Systems: Why Adding Women and Solar Panels Is Not Enough," *Energy Research & Social Science* 68 (October 1, 2020): 101557, doi:10.1016/j.erss.2020.101557.

not confined to, women and mothers—often entails consideration of additional social groups. This includes individuals with diverse needs that extend beyond the typical assumptions about urban residents, such as those who are physically able, financially stable, and perceive public spaces as safe. Identifying women through the lens of their mothers and utilising this classification to overlook the non-gendered needs of other marginalised groups presents a contradiction to feminist ideals.

In this context, feminist energy systems highlight the intricate relationships among activities, infrastructure, and agents, which are closely correlated and cannot be separated. Examining these elements in isolation may mask the intricate nature of their interconnections. This approach necessitates a counter-logic to critically examine and confront various forces, including capitalism, machine-oriented technology, authoritarianism, and ecological violence, which may arise in conjunction or independently. It is essential to recognise that renewable energy systems do not ensure democracy and justice; without suitable energy policies, emerging technologies will fall short in addressing the climate crisis. The public's ownership of energy systems is essential for achieving sustainability and equity. Nonetheless, although renewable energies – like solar and wind power – are viewed as more equitable, their large-scale implementation frequently exacerbates social injustices, as evidenced in Morocco and Mexico. Examining the economic implications, feminist perspectives challenge the idea that energy sacrifice is the sole route to sustainability. This highlights the relationship between energy requirements and human well-being, recognising that benefits are unequal, especially in communities reliant on extractive industries. Universal Basic Income and reducing working hours may serve as potential measures to ease the burden on individuals in these contexts. In a socio-ecological framework, energy systems should exhibit transparency and consider environmental consequences and social equity, highlighting the significance of community engagement in energy-related decision-making processes. Analysing the complete life cycle of energy technologies is crucial for making informed and responsible decisions regarding sustainability and ethics. A feminist approach to technology does not dismiss technology itself; instead, it considers as a tool that requires careful management and comprehension within a social and political framework. Technological innovation must engage communities and focus on addressing the needs of the broader society, rather than being dominated by large corporations, thus fostering an inclusive, diverse, and sustainable energy system.[50]

[50] Ibid.

Within the framework of international law, the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) serves as a significant legal instrument that mandates states to fulfil their obligations towards achieving gender equality, particularly highlighting the role of energy in poverty eradication. Article 14(2)(h) of this Convention mandates that States Parties take measures to eradicate discrimination against women, especially in rural regions, and guarantee that they have access to sufficient living conditions. This includes housing, sanitation, electricity, water supply, transportation, and communication provisions. Furthermore, various pertinent instruments concerning gender equality and access to modern energy services are integral to international policy initiatives to tackle global discrimination against women and address poverty through sustainable development. Many of these can be categorised as 'soft law', which denotes various instruments that lack legal binding authority in current international relations. The instruments encompass the 1995 Beijing Platform for Action and General Assembly resolutions, including the Millennium Development Goals (MDGS), which were established in the United Nations Millennium Declaration in 2000. The connection between gender and energy issues within the SDG Energy Goals and the SDG Gender Goals is expected, considering that not all gender dimensions can be explicitly defined within these policy frameworks. It can be inferred that the Gender Goals are interconnected with the Energy Goals, as articulated in the UN General Assembly resolution that endorses the SDGS: "Achieving gender equality and empowering women and girls will significantly contribute to advancements across all goals and targets".[51]

Moreover, recognising gender equality within the UN system is crucial for achieving a sustainable energy transition for all by 2030. However, phrases like 'energy for all' and 'universal access' in the SDG on energy (Goal 7) are neutral, failing to consider the distinct experiences of energy poverty faced by men and women. The concept of 'universal access' will only represent genuine equality if gender considerations are fully integrated into the analysis. The primary approach utilised by the soft law instruments to promote gender equality and women's empowerment is gender mainstreaming. This involves systematically evaluating the potential impacts on s legislation, policies, or programmes on both women and men across all sectors and levels. This approach ensures that the experiences and needs of both genders are incorporated into the design, implementation, monitoring, and evaluation of policies, so that

[51] Judith Gardam, "A Gender Aware Approach to Legal and Policy Strategies for Achieving Access to Modern Energy Services in Sub-Saharan Africa," in *Ending Africa's Energy Deficit and the Law: Achieving Sustainable Energy for All in Africa*, ed. Yinka Omorogbe and Ada Ordor (Oxford University Press, 2018), 0, doi:10.1093/oso/9780198819837.003.0010.

benefits are shared equally and inequalities are effectively addressed. The main objective is to attain gender equality by focusing on the actual effects of policies and actions, rather than merely formal equality and non-discrimination. This policy has become an important tool for promoting gender equality and women's empowerments evidenced by the actions of UN agencies, regional organisations, member states, and countries affiliated with the United Nations (UN).[52]

Judith Gardam[53] highlights a significant oversight in the energy sector, primarily due to neglecting gender considerations during the planning phase. The initiative seeks to tackle obstacles to gender equality in energy access across three distinct tiers: the political, the energy provider (encompassing both public and private market participants), and the energy consumer tiers. Numerous strategic policies and initiatives exist at the national level, with several integrating gender mainstreaming policies. The Ugandan government has implemented a strategy within its renewable energy policy aimed at enhancing women's participation. Similarly, Zambia's renewable energy policy is dedicated to fostering gender-balanced development in the energy sector.

Additionally, Botswana has incorporated gender considerations into its household energy supply policy. The concept of gender mainstreaming is prevalent and recognised, yet one must consider whether it has resulted in any significant impact. Hilary Charlesworth and Christine Chinkin[54] further express substantial concerns regarding implementing these strategies, viewing them as detrimental to achieve genuine equality between men and women. Charlesworth[55] highlights the oversight in acknowledging that achieving gender equality necessitates transformation for both genders. International institutions' gender mainstreaming policies have often equated 'gender' with 'women', which has led to a lack of clarity regarding the distinction between sex and gender. This pattern has similarly been noted within the African context at the national level. Its implication of neglects the analysis of men's roles and male gender identities, treating them as if they are inherent and immutable.

The energy sector in Indonesia plays a crucial role in national development, as it is intricately correlated to the population's livelihoods, welfare, and overall quality of life. The energy sector is subject to multiple regulations, including Article 4 paragraph (1) of the 1945 Constitution of the Republic of Indonesia. Additionally, several laws are pertinent, such as Law

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52 Ibid.

53 Ibid.

54 Hilary Charlesworth and Christine Chinkin, *The Boundaries of International Law: A Feminist Analysis* (Manchester University Press, 2022).

55 Hilary Charlesworth, "Talking to Ourselves? Feminist Scholarship in International Law," in *Feminist Perspectives on Contemporary International Law* (Hart Publishing, 2011), 17–32.

No. 30 of 2007 concerning Energy, Law No. 30 of 2009 on Electricity, and Law No. 4 of 2009 on Mineral and Coal Mining, along with the amendments specified in Law No. 3 of 2020.

The regulations in question include government and presidential directives that shape energy policy. Notably, Government Regulation No. 79 of 2014 outlines the National Energy Policy, while Presidential Regulation No. 1 2014 provides guidelines for preparing the National Energy General Plan. Additionally, Presidential Regulation No. 22 of 2017 offers a detailed National Energy General Plan framework. The primary focus of the National Energy Policy and the National Energy General Plan is the transition of energy sources, moving away from fossil fuels towards renewable energy alternatives. The 2017 Presidential Regulation on the National Energy General Plan outlines the Indonesian government's objective of achieving 23% renewable energy utilisation by 2025, with an anticipated increase to 31.2% by 2050.

Upon examination of the regulations above, it is evident that gender mainstreaming has not yet been fully incorporated into energy regulations and policies at the national level. Despite the enactment of Presidential Instruction No. 9 on Gender Mainstreaming in National Development in 2000, there remains a lack of integration of gender aspects across all areas of development. Gender has not yet been fully integrated, particularly regarding women's representation on the National Energy Council. Several initiatives are starting to demonstrate efforts to incorporate women's participation, both in the implementation and policy formulation stages. The Gender Mainstreaming Programme, launched by the Ministry of Women's Empowerment and Child Protection in collaboration with the Ministry of Energy and Mineral Resources, serves as a notable instance of an initiative aimed at integrating a gender perspective into the planning processes of the energy sector. Significant as women's involvement in grassroots energy transition programmes may be, local participation alone cannot rectify inequalities. For real change, this must be complemented by women's engagement in high-level decision-making and policy formulation.

The Indonesian Women's Coalition identified multiple concerns regarding energy and its intersection with women's issues, notably that the energy discourse has not incorporated a gender perspective. The New Renewable Energy Bill lacks any considerations or clauses about women's empowerment. The most recent draft released by the Indonesian House of Representatives omits the principles of gender equality and non-discrimination. From the mini-faction's viewpoint, there is a notable lack of focus on the complex interplay between sustainable energy issues and the principles of gender equality, non-discrimination, and women's empowerment. The Indonesian Women's Coalition suggests that the House of Representatives

consider various aspects of gender equality, specifically referencing: The Convention on Economic, Social, and Cultural Rights (Law No. 11 of 2005), the Convention on Civil and Political Rights (Law No. 12 of 2005), the Convention on the Elimination of Discrimination Against Women (Law No. 7 of 1984), and Presidential Instruction No. 9 of 2000 regarding Gender Mainstreaming.

Women continue to be categorised as consumers rather than active production contributors. In Indonesia, the prevailing patriarchal culture continues to assign women the domestic household affairs, positioning them as key factors in energy efficiency yet leaving them disproportionately vulnerable to energy consumption. Because women are often viewed merely as consumers rather than decision-makers, energy policy frequently remain "gender-blind," overlooking the specific challenges they face. The Indonesian Women's Coalition argues that this lack of inclusive governance, coupled with energy crises, directly fuels the poverty experienced by women. The Inspirational Mothers programme in East Nusa Tenggara addresses poverty by providing access to information regarding suitable technology launched by Kopernik[56] focuses on enabling women in remote regions to share information regarding suitable technology through various interactions at home, in markets, and during community events.

Women are disproportionately affected by environmentally harmful energy management practices. In this context, those who utilise energy frequently experience the most significant impacts from environmentally detrimental energy management practices. In patriarchal societies, the allocation of domestic responsibilities often falls to women, who typically engage in tasks such as cooking while utilising potentially hazardous energy sources like gas, kerosene, and firewood. Lack of education regarding proper energy use places women at risk for health issues, including respiratory infections when using firewood. In 2016, East Nusa Tenggara recorded a firewood usage of 77.58%, compared to 21.05% for kerosene. These data suggest that women are significantly impacted by the management of energy sources that are not environmentally sustainable.[57]

The intersection of gender equality, women's empowerment, and renewable energy presents a unique opportunity. Address these interconnected issues can be done by facilitating women's active involvement in the development, management, and transition to renewable energy. Desti Alkano, Co-Founder of Energy Academy Indonesia/Ecadin, emphasised that

[56] Kopernik, "Motivation and Aspiration: What Lies Behind the Wonder Women Program," 2018, https://kopernik.info/en/news-events/blog/motivation-and-aspiration-what-lies-behind-the-wonder-women-program.

[57] Nikmah, "Perempuan Dan Energi Terbarukan: Erat Yang Luput Dari Perhatian."

women have the potential to play a crucial role in the energy transition, primarily when they are engaged with environmental issues and equipped with intuition, empathy, and collaborative abilities.[58] Batu Menyan Village in Lampung serves as a notable case where women are at the forefront of the energy transition within their community, effectively managing a solar energy cooperative. Nonetheless, these achievements are constrained and sporadic as long as women are excluded from participating in developing national policies that shape the direction, funding strategies, and execution frameworks of renewable energy initiatives. In decision-making environments predominantly influenced by men, policies regardless of their purported "gender-neutral" intentions, frequently fail to adequately address or prioritise the complexities of women's experiences and requirements. The participation of women in decision-making roles is essential to guarantee that energy policies go beyond mere symbolic references to "women's participation" and genuinely address the intricate realities women encounter in practice.

An additional illustration of the significant influence women can exert in policy-making roles is evident in Iceland's progressive energy policy. Ragnheiður Elín Árnadóttir stands out as a substantial figure, having served as Iceland's Minister of Industry and Energy from 2013 to 2017.[59] She advocated for the advancement of inclusive geothermal and hydro energy, highlighting the critical role of women's involvement in all phases of energy policy planning and execution. The Icelandic government mandates that energy companies assess and report on gender equality within their organisational frameworks, ensuring that diverse gender perspectives inform strategic decisions. A report by the IRENA[60], the participation of women in leadership roles within the energy sector has led to the development of policies that better address social, environmental, and local community requirements.

Iceland's experience illustrates that the participation of women in strategic roles can guide the energy transition beyond simple technological advancements, evolving it into a significant and equitable process. This highlights a considerable disparity compared to the Indonesian context, where women's presence in strategic decision-making roles within the energy sector remains limited. Furthermore, key policies, including the Electricity Supply Business Plan and the Energy Transition Partnership seldom incorporate meaningful gender equality considerations. Examining this case reveals that gender mainstreaming should be viewed as an

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[58] Ibid.

[59] Ragnheiður Elín Árnadóttir, "The Untapped 'Girl Power' in the Energy Sector," *New Atlanticist* (Atlantic Council, March 7, 2017), https://www.atlanticcouncil.org/blogs/new-atlanticist/the-untapped-girl-power-in-the-energy-sector/.

[60] IRENA, *Renewable Energy: A Gender Perspective*.

integral component of policy rather than a supplementary element for successfully implementing the energy transition process.[61]

Germany serves as a pertinent case study illustrating that the participation of women in decision-making roles within the energy sector enhances the social legitimacy of energy transition policies and adds depth to the core principles of sustainability. In the context of *energiewende*, Germany's significant policy transition from fossil fuels and nuclear energy to renewable sources, women are crucial not only as practitioners in the field but also as intellectual contributors, technocrats, and leaders in shaping national policy direction.[62]

Claudia Kemfert stands out as a prominent energy economist affiliated with the German Institute for Economic Research (DIW Berlin) and serves as an advisor to the German government. She has persistently championed social justice and ecological sustainability within Germany's energy transition. Her reasoning is firmly based in economics and quantitative data, while also anchoring in philosophical principles that emphasise the inseparability of sustainability from justice and participation. Kemfert highlights that the future energy system encompasses clean technology and the influence of stakeholders in shaping the trajectory of change and the distribution of benefits from the transformation.[63]

The inclusive approach established in *energiewende* policy is evident in the institutional framework and public consultation platforms that create genuine opportunities for women and civil society organisations to engage. Consequently, Germany's energy transition has garnered significant public support, as the initiative is perceived not just as a technical project but as a collective ethical obligation to future generations and the preservation of ecological integrity.[64] This indicates that involving women in decision-making processes can transform the policy

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61 Brynhildur Davíðsdóttir, "Towards an Icelandic Sustainable Energy System," in *Successful Public Policy in the Nordic Countries: Cases, Lessons, Challenges* (Oxford University Press, 2022).

62 Bianca Prietl, 'Technology Change = Gender Change? Androcentric Construction of Engineering as Symbolic Resource in the German-Speaking Area of Renewable Energies', *Engineering Studies* 9, no. 1 (2017): 3–23, https://doi.org/10.1080/19378629.2017.1306066; Rudolf Rechsteiner, 'German Energy Transition (Energiewende) and What Politicians Can Learn for Environmental and Climate Policy', *Clean Technologies and Environmental Policy* 23, no. 2 (2021): 305–42, https://doi.org/10.1007/s10098-020-01939-3.

63 Claudia Kemfert, *Schockwellen: Letzte Chance Für Sichere Energien Und Frieden* (Campus Verlag, 2023); Claudia Kemfert et al., *Deep Decarbonization in Germany: A Macro-Analysis of Economic and Political Challenges of The'energiewende'(Energy Transition)* (DIW Berlin: Politikberatung kompakt, 2015).

64 Eberhöfer, "The Role of Women's Networks in the German Energy Transformation"; Kemfert et al., *Deep Decarbonization in Germany: A Macro-Analysis of Economic and Political Challenges of The'energiewende'(Energy Transition)*; Jörg Radtke, "Understanding the Complexity of Governing Energy Transitions: Introducing an Integrated Approach of Policy and Transition Perspectives," *Environmental Policy and Governance*, March 24, 2025, doi:10.1002/eet.2158; Jörg Radtke, "E-Participation in Energy Transitions: What Does It Mean? Chances and Challenges Within Germany's Energiewende," *Technological Forecasting and Social Change* 210 (January 1, 2025): 123839, doi:10.1016/j.techfore.2024.123839.

narrative, moving from a focus on technical efficiency to a broader emphasis on values like solidarity, empathy, and intergenerational justice.

The insights derived from Germany indicate that the effectiveness of the energy transition extends beyond mere metrics of emission reductions or the expansion of renewable energy capacity. It also hinges on the calibre of public discourse and incorporating human values within policy frameworks. The participation of women in this context transcends a simple demographic consideration; it serves as a significant epistemological influence that enriches our comprehension of the interplay among humans, technology, and nature. In Indonesia, where hierarchical and male-biased decision-making structures persist, this lesson holds significant weight: establishing equal opportunities for women in policy formulation transcends mere representation; it is essential for facilitating a genuinely transformative and equitable energy transition. Therefore, the success and fairness of the energy transition hinge on recognising women's participation as crucial, not just during implementation, but also within the policy frameworks and institutions that shape programme development and resource distribution. This equality serves not only as a moral obligation but also as a critical approach for developing responsive, inclusive, and sustainable policies.

The selection of legal instruments presents a notable challenge; despite the potential benefits for women's advancement, there is a discernible hesitance within the UN system and at both regional and national levels to embrace formal legal instruments. Additionally, current trends suggest that this reluctance is unlikely to shift in the foreseeable future. Regarding numerous challenges in realising transformative change, various regions have a discernible commitment to formulate and enhance gender-sensitive energy access policies. What insights does the literature provide regarding the essential components? The involvement of women possessing the requisite skills across all tiers of decision-making and within the energy sector is deemed crucial. However, based on previous observations in the realm of gender mainstreaming, it is evident that merely mandating women's involvement at all tiers of decision-making is insufficient. Instruments that delve deeper into the gender aspects of all elements and outline how these should be addressed show significant potential. This is relevant to both the development of legal and policy frameworks, as well as their combinations. The elements in question specifically encompass access to energy services, availability, and affordability. It is evident that merely mandating equal access to energy services does not ensure equal access for both men and women. It is essential to identify the varying energy requirements of men and women in both urban and rural communities and to develop strategies for recognising and

addressing these disparities. Additional critical components of gender-sensitive documents include provisions that enhance access to energy, thereby creating opportunities for women to secure improved educational and health resources. The development of economic opportunities for both men and women must be prioritised through meticulously outlined provisions. Furthermore, as previously noted, a significant disparity exists between women and men concerning their capacity to organise the provision and financing of energy resources.

Indonesia's commitments at the CEDAW conference and the 2030 Sustainable Development Goals should prompt the government to incorporate gender considerations, non-discrimination principles, and women's empowerment into the energy transition agenda. This represents a growth potential that may yield various advantages. National sovereignty, resilience, and independence should be pursued in conjunction with the principles of gender equality, non-discrimination, and women's empowerment across all development areas. Currently, the Draft Renewable Energy Law lacks the incorporation of principles related to gender equality and the prohibition of discrimination against women. The mini-faction observes that there has been a lack of integration between renewable energy issues and gender equality, particularly in a multidimensional context. While evaluating the New and Renewable Energy Bill, two public hearings were conducted with organisations concentrating on women's issues, including the Indonesian Women's Coalition and Women in Nuclear. Nonetheless, this does not adequately guarantee the integration of aspirations for gender equality into the draft law. The latest draft of the New Renewable Energy Bill does not meet the Indonesian Women's Coalition's expectations regarding gender considerations, non-discrimination values, and initiatives for women's empowerment.

Comprehensive implementation of meaningful participation is essential to guarantee that the articulated aspirations are given appropriate attention. This encompasses the entitlement to have one's voice acknowledged, the obligation to be considered, and the necessity to obtain clarification regarding the opinions that have been articulated. As a signatory to the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), Indonesia has the potential to reduce discrimination against women in the energy sector. Article 5(1) of CEDAW mandates that States Parties implement suitable measures to alter the social and cultural behaviours of both men and women, including educational initiatives, media engagement, and other relevant methods aimed at fostering equality between the sexes and eradicating biases and traditional practices rooted in the notion of one sex's inferiority. Consequently, it is essential for women to participate in the energy policy-making process, not

just as passive entities but as active contributors. Considering the significant connection between women's lives and energy, the state must create avenues for women's empowerment within the energy sector.

The UN identifies five critical components of women's empowerment: 1) it emphasises the importance of women's awareness of their self-worth; 2) it highlights the right to make choices; 3) access to essential opportunities and resources; 4) women should have the right to control their lives, both within the home and in society at large; and 5) influencing social change is crucial for establishing a more equitable social and economic order at both national and international levels. In this new discourse of women's empowerment, the "third world woman" was conceptualised as an autonomous and sovereign subject who freely made rational choices in the market, characterised by thrift, hard work, entrepreneurship, effective resource management, control over reproductive health, small families, and the exercise of voting rights. Research from Gender and Development (GAD) feminists also demonstrated that investing in women was an investment in the welfare of children and families.[65]

In Indonesia's energy transition, the inclusion of women in decision-making roles transcends mere normative expectations of gender equality; it represents a critical necessity that encompasses epistemological, ecological, and social dimensions. This approach is fundamentally based on feminist political ecology, highlighting that gender dynamics influence the interactions between humans and the environment. It asserts that women possess distinct experiences, local knowledge, and ecological insights frequently neglected in energy policies that tend to be dominated by masculine and technical perspectives.

This theory emphasises that women, especially in rural and peri-urban areas of Indonesia, have a crucial role in the utilisation, management, and conservation of household and local energy resources. However, this role remains unrecognised in policy formulation processes. In the framework of development characterised by patriarchal reasoning, women are perceived as passive recipients instead of active participants in formulating solutions. Consequently, policies developed through these processes tend to lack social justice and frequently do not meet communities' fundamental needs.

This argument can be substantiated through the ethics of care, a moral framework articulated by philosophers like Carol Gilligan[66] and Nel Noddings[67]. This highlights that care,

[65] Lamia Karim, "NGOs, State and Neoliberal Development in South Asia: The Paradigmatic Case of Bangladesh in a Global Perspective," in *Routledge Handbook of Gender in South Asia* (Routledge, 2021), 289–302.

[66] Carol Gilligan, *In a Different Voice: Psychological Theory and Women's Development* (London: Harvard University Press, 1982).

interconnectedness, and shared responsibility are the core elements of ethical decision-making, opposing the prevailing approach in public policy that depends on abstract principles of universality and objectivity. When energy policy decisions are driven exclusively by technical efficiency and macroeconomic factors – while neglecting the genuine experiences at the local level, particularly those managed by women – these policies undermine their ethical basis. In Indonesia's varied and multifaceted context, a care-based approach offers a more suitable framework for simultaneously addressing ecological, social, and gender needs.[68]

Additionally, John Rawls[69] theory of distributive justice serves as a framework to analyse how gender inequality in energy policy formulation compromises the principle of fair equality of opportunity. The systematic exclusion of women from decision-making arenas results in an inequitable distribution of energy resources and benefits, limiting their ability to exert influence.

The disparity in women's involvement in the renewable energy transition in Indonesia is evident in the limited representation of women in key roles within technical ministries, including Energy and Mineral Resources, the State Electricity Company, and planning agencies like National Development Planning Agency. Data analysis from the Central Statistics Agency and annual reports from various ministries indicates a persistent male dominance in policy-making roles within the energy sector. This trend is evident across boards of directors, regulatory bodies, and national policy-making teams, including the Electricity Supply Business Plan and the Just Energy Transition Partnership. The resulting policies, while ostensibly neutral, fail to adequately address women's distinct needs. This includes access to energy for Micro, Small, and Medium Enterprises (MSMEs) primarily operated by women and the health consequences associated with biomass burning in households. Examining the socio-political landscape, the inclusion of women in policy-making roles acknowledges their agency as complete citizens, rather than as a marginalised group. In deliberative democracy, as articulated by Jürgen Habermas[70], legitimate public decisions emerge from the engagement of all impacted groups. Disregarding women's perspectives compromises the deliberative legitimacy inherent in energy policy formulation.

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67 Nel Noddings, *Caring: A Feminine Approach to Ethics and Moral Education* (University of California Press, 2003).

68 Aga Natalis, Ani Purwanti, and Teddy Asmara, "The Law's Critical Role in Developing Human-Environment Relationships after COVID-19 Pandemic (A Study of Ecofeminism)," *International Journal of Sustainable Development and Planning* 18, no. 1 (January 31, 2023): 153–60, doi:10.18280/ijsdp.180116; Aga Natalis, Ani Purwanti, and Teddy Asmara, "Anthropocentrism Vs Ecofeminism: How Should Modern Environmental Law Be Reformed?," *Sortuz: Oñati Journal of Emergent Socio-Legal Studies* 13, no. 1 (April 24, 2023): 38–68, https://opo.iisj.net/index.php/sortuz/article/view/1686.

69 John Rawls, *A Theory of Justice: Revised Edition* (United States: Harvard University Press, 1971).

70 Jurgen Habermas, *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society* (MIT press, 1991).

Consequently, to foster a sustainable and equitable energy transition, Indonesia needs to realign its policy framework from a predominantly masculine technocratic perspective to one that is transformative and inclusive. The women's involvement in decision-making processes is more than a matter of principle; it is an essential component for energy policies to effectively tackle ecological, social, and economic challenges comprehensively. Without this inclusion, the energy transition being merely a change in energy sources rather than a fundamental social transformation.

In this context, specific actions must be taken to guarantee the implementation of gender-responsive policies. A critical measure involves the thorough execution of Gender Responsive Budgeting (GRB) within the energy sector, which remains sub-optimally implemented despite the directive established by Presidential Instruction No. 9 of 2000 concerning Gender Mainstreaming in National Development. GRB should function as a mechanism to guarantee that energy budgets address the distinct requirements of women, including access to clean energy technology for women-owned micro, small, and medium enterprises (MSMEs) and incentives for renewable energy training for marginalised women. Conversely, technical regulations in the energy sector, including the Minister of Energy and Mineral Resources Regulation concerning the preparation of the National and Regional Energy Master Plans and the Electricity Supply Business Plan, should be revised to incorporate gender analysis obligations at every stage development.

The implementation of deliberative democracy principles necessitates the presence of structurally inclusive participatory mechanisms. Establishing a women's energy consultative forum at the national and regional levels is also crucial. This platform will systematically channel women's voices from diverse backgrounds, such as technocrats, micro, small, and medium enterprises, community leaders, and environmental activists, into energy transition policies to serve a significant role in programme evaluation, energy roadmaps developments, and the oversight of equitable benefit distribution. The outlined steps reinforce the position that women's involvement should extend beyond mere symbolic gestures or pilot projects, necessitating integration into regulations, budget frameworks, and decision-making processes. Recognising women's agency in energy democracy enhances deliberative legitimacy and leads to the development of more effective, inclusive, and sustainable energy transition policies that are socially and ecologically sound.

E. Conclusion

Analysis of Indonesia's renewable energy policies and practices confirms the country's substantial potential, from 207.8 GW of solar capacity to bioenergy and ocean-wave resources. However, national policy is primarily influenced by technocratic and macroeconomic frameworks, which frequently neglect the women's roles throughout the energy transition process. The dominant "gender-neutral" framework obscures deep-seated patriarchal biases, framing women as passive consumers tasked with domestic responsibilities and household energy management while systematically excluding them from strategic policy development, technical training, and decision-making roles.

Evidence indicates that involving women significantly improves the sustainability and social acceptance of small-scale energy projects, contributing valuable ethical and distributive justice perspectives to policy discussions. The "Sumba Iconic Island" programme serves a notable case, enabling village women to take on roles as technicians and energy educators. This initiative promotes the adoption of renewable technologies and enhances local capacities for sustained development. Feminist scholarship and the contributions of Gilligan, Noddings, and Rawls highlight the importance of incorporating care ethics and social-justice principles into technical policy design, which serves to harmonise efficiency with equity and the preservation of ecosystems.

International models from Iceland and Germany demonstrate that when gender mainstreaming is considered as a fundamental component, it can transform policy discussions from simple capacity targets to broader ethical objectives. Mechanisms such as mandatory gender-equity reporting for energy companies and inclusive public consultations have transformed women from mere beneficiaries into strategic partners in decision-making. This approach highlights the importance of solidarity, active participation, and the responsibility across generations, ultimately contributing to a more equitable and sustainable energy transition.

To guarantee that women are acknowledged as essential agents of change, Indonesia must adopt structural reforms: implement Gender-Responsive Budgeting (GRB) throughout all energy sector allocations; revise technical regulations (National Energy General Plan and Electricity Supply Business Plan) to mandate gender-impact analyses at every stage; and create women's energy advisory forums at both national and regional levels. Such measures will guarantee that perspectives from a diverse range of stakeholders, including technocrats and small-business entrepreneurs, are meaningfully incorporated into developing the roadmap and evaluating policies. As a results, Indonesia's energy transition must be more than a substitution of energy

sources; instead, it must be a socially and politically transformative process, characterised by justice, inclusivity, and sustainability.

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