

Sustainable Business Model Strategy Towards Renewable Energy Business: A Case Study in Indonesian Electricity Company

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Abstract: In an era where sustainable development is crucial for combating climate change and ensuring the longevity of resources for future generations, Indonesia is redefining its approach to energy production. The global drive towards sustainability, as emphasized by the 2030 Agenda for Sustainable Development, demands a transition from fossil fuels to renewable energy sources. This paper presents a case study within an Indonesian Electricity Company, illustrating the development of a sustainable business model strategy in the renewable energy sector, with a particular focus on harnessing the nation's abundant solar, geothermal, and hydroelectric potential. Through the employment of the Analytic Network Process (ANP) and the Preference Ranking Organization Method for Enrichment Evaluations (PROMETHEE), this study meticulously formulates a business strategy that navigates the complexities and dynamic nature of the energy market. It seeks to optimize emergent opportunities while aligning with economic, social, and environmental goals. This integration involves creating jobs, reducing carbon emissions, and conserving resources, hence contributing to the Triple Bottom Line of sustainability. The model promotes job creation, decreases carbon emissions, and supports resource conservation, all integral to the sustainable business paradigm. The ultimate objective of this research is to establish a strategic blueprint for electricity providers, guiding the efficient use of Indonesia's renewable energy potential. This initiative is anticipated to significantly contribute to the country's sustainable development and fortify its green economy. The case study exemplifies a holistic progression towards economic resilience, social responsibility, and environmental custodianship in Indonesia's journey toward a renewable energy future.

Keywords: Energy Transition, Sustainable Business Model, Renewable Energy Development, Triple Bottom Line, Value Creation.

1. Introduction

Sustainable development is the development of environmental management to meet current natural resource needs without having to sacrifice the availability of natural resources for future generations. Climate change presents a formidable challenge with its extreme variability, affecting the availability of natural resources and impacting various facets of life. Sustainable development is the main focus in dealing with climate change and global economic development. Climate change is a serious risk in terms of extreme variability, which impacts various aspects of life and the availability of natural resources [1]. The response to this challenge was encapsulated in the global consensus reached during the 70th United Nations General Assembly with the adoption of the 2030 Agenda for Sustainable Development. Specifically, Goal 7 of the Sustainable Development Goals (SDGs) emphasizes the necessity for clean, affordable, and sustainable energy, setting a clear direction towards achieving a balance

between economic growth, environmental sustainability, and human well-being, the principles of the green economy.

The green economy necessitates a shift from traditional fossil fuel-based energy systems to those based on low-carbon and renewable energy sources. This transition encompasses the development of renewable energy infrastructure, the enhancement of energy efficiency, the adoption of sustainable industrial practices, and the promotion of energy conservation. Given the significant role of electricity supply in consuming fossil energy, the transition within the electricity sector from conventional to renewable sources is crucial for mitigating environmental impacts and ensuring long-term economic and environmental sustainability. As energy needs continue to increase rapidly, the development of renewable energy-based power plants is important to overcome energy shortages both now and future [2]. Indonesia, endowed with an abundance of natural resources, is at a strategic juncture to harness solar, geothermal, and hydropower resources to meet its energy demands. Indonesia's renewable energy industry faces challenges, and a better policy framework is needed to boost investment and supply chain management [3]. The Indonesian government's initiatives to set carbon emission limits and standards for industry, coupled with the growing market demand for environmentally friendly products and services, present a unique opportunity for the development of renewable energy. Consumers' increasing environmental consciousness and investors' consideration of environmental performance in their investment decisions further bolster the case for renewable energy.

This research aims to develop a business model strategy tailored to the renewable energy sector in Indonesia, focusing on the provision of renewable electricity supplies. This strategy involves crafting a business model framework that not only addresses current energy needs but also fosters sustainability in using renewable energy resources. Business models can describe the evolution of energy service companies and can analyze challenges in developing energy efficiency services and innovation [4]. The envisioned sustainable business model seeks to harmonize economic profitability with social and environmental benefits, including job creation, carbon emission reduction, and the preservation of natural resources.

The research examines elements that affect the delivery of renewable energy to develop methods that maximize revenue and have a beneficial influence on society and the environment. The main objective is to provide a strategic framework for electricity suppliers in Indonesia to efficiently utilize the nation's renewable energy resources. Indonesia has massive renewable energy potentials, potentially enabling a 100% renewable electricity system with limited impact on land availability [5]. This approach is expected to contribute to the broader objectives of sustainable development and the green economy, ensuring that Indonesia's natural wealth is utilized in a manner that is economic, social, cultural, and ecologically sustainable.

2. Literature Review

a. Sustainable Development

The United Nations (UN) World Commission on Environment and Development's 1987 report, "Our Common Future," was the first to introduce the idea of sustainable development. Sustainable development is a development concept that meets the needs of the current generation without sacrificing the abilities of the current generation, future to meet their own needs. This concept focuses on the integration of three main dimensions of development, namely economic, social, and environmental. In the economic aspect, there are several goals to be achieved, such as increasing economic growth, overcoming poverty, and changing production and consumption patterns so that they are balanced. Meanwhile, in the social aspect, the focus is on solving population problems, improving community services, improving the quality of education, and so on. Environmental aspects have objectives that include efforts to reduce and prevent pollution, manage waste, and preserve natural resources. Thus, sustainable development goals focus on these three dimensions, namely sustainable economic growth, fair and equitable social progress, and ecological balance in harmony with lifestyle changes [6].

One of the challenges to achieving the SDGs is the global change occurring in the world today. The process of globalization causes any change in one part of the world or a particular field to quickly influence other phenomena or spread to other parts of the world, including economic development. The current market system is developing

into a single global market where no country can isolate itself from the international environment. However, this world change also provides opportunities for national economic development if managed well. Increasing national economic resilience is important for facing the positive and negative impacts of globalization. A country's economic resilience is realized when the economy has stability that is not shaken by the uncertainty caused by globalization and is able to improve people's welfare. So the concept of a green economy emerged in an effort to increase global economic resilience through sustainable development.

The green economy concept involves various triple bottom line aspects, including economic, social, and environmental. This concept is a major effort in achieving environmental sustainability and social economic goals that are aligned and compatible. Pearce et al. (1989) were some of the early authors who outlined the concept of a green economy [7]. They introduced the idea that investments in natural resources could create jobs and greater economic prosperity than investments in traditional physical capital. Green economic practices are considered an economic approach that pays attention to long-term planning because, through these practices, they can reduce levels of poverty, carbon dioxide emissions, and ecosystem degradation [8]. The new concept of a green economy was introduced after the 2012 UN Conference on Sustainable Development in Rio de Janeiro, which resulted in a document entitled "The Future We Want," which contains a joint vision of heads of state and government to renew their commitment to sustainable development and relies on the concept that environmental conservation must benefit both the economy and society. The green economy in the context of energy policy is closely related to clean energy policy and has a more politically applied focus. So this green economy requires public policy support for implementing clean energy development. This concept has great potential to stimulate growth globally. Strategies for designing energy policies can make a significant contribution to achieving sustainability in economic, social, and environmental dimensions [9].

The implementation of a green economy globally has received increasing attention in recent years. In many countries, certain efforts have been made to encourage a green economy, such as investment in renewable energy, energy efficiency, and sustainable agricultural practices. Countries like Denmark and Germany, for example, have invested heavily in renewable energy and energy efficiency and created many jobs. China has also become a global leader in green infrastructure development, especially in the field of renewable energy. In ASEAN, Vietnam and Thailand have invested in renewable energy and sustainable agriculture and implemented policies to reduce greenhouse gas emissions and air pollution [10]. Meanwhile, in Indonesia, the government has implemented several policies to encourage a green economy. One of them is the Master Plan for Acceleration and Expansion of Indonesian Economic Development (MP3EI), which focuses on developing sustainable and environmentally friendly industries. Indonesia has also launched the Green Indonesia Vision 2050, which outlines the country's strategy for achieving sustainable, low-carbon economic growth. This includes measures such as increasing energy efficiency and developing renewable energy, especially in the provision of renewable electricity supplies. The link between sustainable development and the green economy lies in the common goal of achieving sustainable economic growth, improving social welfare, and maintaining ecological balance. Sustainable development is the basis of the green economy concept, where green economic development is directed at achieving sustainable development goals. Global efforts such as the SDGs, Sendai Framework, Addis Ababa Action Agenda, and Paris Agreement reflect the world's commitment to realizing sustainable development and a green economy. Green energy strategies can contribute to sustainable development and economic growth by reducing negative effects on industrial, technological, and social development [11]. Overall, sustainable development and the green economy provide direction and the foundation for global and national efforts to achieve sustainable development, bringing together economic, social, and environmental aspects to create a sustainable future.

b. Sustainable Business Model

A business model is the strategic framework of an organization that outlines how the corporation may generate and retain customer value. It is a comprehensive idea that strives to meet customer expectations, deliver value to the organization, and yield economic advantages. This perspective emphasizes the role of a business model in providing firms with the opportunity to consider customer loyalty [12]. Another opinion argues that a business

model is the organized design of an organization to produce economic prospects [13]. Additionally, it is important to contemplate how a firm might generate its own value in order to enhance consumer perceptions regarding the distinctiveness of the products or services being promoted. Finally, a business model is formulated with the objective of generating economic value. Therefore, it is crucial for a business model to consider all the advantages and expenses that will be obtained and expended during future operations [14].

A business model serves as a blueprint for a company's operations, outlining how it does business, the impact of policies on stakeholders (such as partner firms, customers, and partners), and how the company's internal systems fulfill its operational requirements [15]. This opinion centers on the fundamental business strategies employed by the organization, encompassing its intentions to grow, acquire, or sustain itself in the prevailing circumstances. It is vital to take into account policies designed for stakeholders, as stakeholders possess influence and authority over the conducted business. The policies must be designed to meet the interests of all existing policy stakeholders in order to prevent any feelings of envy among stakeholders who perceive their rights and views as being disregarded or unheard. The business model is acknowledged as a mechanism for examining and delineating the manner in which an organization functions and offering guidance. Zott et al. (2011) perceive the business model as a structure that guides all the actions of a firm, involving both external and internal stakeholders [16]. The business model must also be capable of addressing the financial aspects associated with the entire business lifecycle, encompassing the establishment and operation of the business, as well as the management of unforeseen events or crises that necessitate financial intervention. A business model is a strategic framework employed by a firm to design, administer, and enhance its business operations, taking into account consumer value, economic gains, stakeholder concerns, and financial factors comprehensively. Although the business model may be unreliable, organizations must persist in designing business model strategies that align with market demands and organizational objectives.

Innovative business models can meet the challenges of sustainable development and face global issues, especially those related to energy. A model can be interpreted as a physical, mathematical, or logical representation of a system, entity, phenomenon, or process that aims to understand, communicate, explain, or design interesting aspects of the system, with explicit or implicit mapping. Meanwhile, a business is an organization that engages in trading goods, services, or both with consumers to produce value-added benefits and profits [17]. The business model in question is the content, structure, and governance of transactions designed to create value through the exploitation of business opportunities [16]. Another thing that is essential is innovation in terms of financial management, where a business must go through difficult conditions, and when this happens, it needs a financial strategy that is strong and solid enough to be able to survive in the existing industry [18]. Business model innovation can be a response to environmental changes, as an organization's business model may be disrupted due to technological advances. Kiron et al. (2013) have identified the obstacles that companies face in terms of integrating innovation driven by sustainable development into the company's business model [19]. This research defines the process by which new business models are developed, or business model innovations, for the purpose of sustainable business development, predicting changes in the business and social environment, and responding to sustainable development issues. Several studies show that changing business models is one of the most sustainable forms of innovation. Business model innovation itself can be a path to competitive advantage if the model is sufficiently differentiated and difficult for incumbents and new entrants to imitate [20]. To gain competitive advantage, companies adapt business innovation to build new business models by continuing to develop new value propositions, reinvent customer value, and create new business models to avoid intense competition and maintain competitive advantage [21].

Osterwalder and Pigneur (2010) developed a business model by strengthening and refining the BMC framework. This framework provides guidelines for the business planning process by taking into account four core aspects: value capture, value delivery, value creation, and value proposition [22]. Müller (2019) conducted research on the implications of business models for Industry 4.0 using the BMC framework and found that the strength of resources and value proposition were the two most affected aspects of the business model, while channels were the least affected [23]. Apart from BMC, which has been widely developed, new processes and products can be developed after testing idea generation and problem gaps [24]. Apart from that, the business model cannot be

separated from the partnership structure that will be built to support the business [25]. In the BMC framework, which includes these nine dimensions, it still cannot reach sustainable business. The concept of a sustainable business model is a new framework that needs to be considered because it does not only focus on the profit aspect but also provides added value for customers. This concept requires adjustments to include social and environmental indicators. According to Cardeal et al. (2020), sustainable business models are developing in literature and industry, encouraging companies to look for opportunities to increase their impact on the three pillars of sustainability, namely profit, people, and planet (economic, social, and environmental) [26]. Joyce and Paquin (2016) have previously conducted research and produced a new business model framework for businesses that focus on sustainability [27]. This framework adds an environmental layer to obtain a value proposition on environmental and social aspects. This study is strengthened by the results that illustrate the sustainable value proposition for new markets or products by considering the three pillars of sustainability, namely environmental, economic, and social [28]. However, previous research found that the limitations of the analysis were that it was not detailed enough and could not solve problems that had dynamic models or had high complexity.

3. Methods

The research method used in this research is the Analytical Network Process (ANP), where ANP will help describe the relationships and dependencies between factors in the network and also allow calculating priority weights for each factor based on the level of importance in the sustainable business model framework. ANP has been used in research that integrates clean energy systems from wind power and solar power for Internet of Vehicles (IOV) and Internet of Things (IOT)-based battery charging and swapping stations [29]. In addition, the approach with ANP shows that important factors are analyzed in the control mechanism of EPC projects for green buildings [30]. ANP is used to explore key factors [31]. In this way, we can achieve a better understanding of complex systems and take better decisions based on collaborative knowledge and in-depth analysis based on the necessary priorities and weights. After the ANP analysis, which produces priority weights on the resulting criteria, in selecting a business model, a selection method is needed through multicriteria decision making, one of which is the Preference Ranking Organization Method for Evaluation Evaluations (PROMETHEE). This method has the ability to handle many comparisons; the decision-maker only defines his own scale of measurement without limitations, defining his priorities and preferences for each criterion by deciding on a value without thinking about the calculation method. PROMETHEE is a superiority method that is highly adaptable to different problem structures [32]. By combining these two methods, it produces more complex assessment results [33]. Therefore, by integrating these methods, it will produce more accurate and objective results in multi-criteria decision-making. ANP is used to give weight to the criteria and PROMETHEE is used to rank the appropriate business models.

Based on their basic knowledge and experience with the topic, decision makers should enter the measurement criteria they have defined in the questionnaire, calculate the weight of each factor across the decision architecture using the obtained values, and then identify the most influential factors. The ANP process is divided into six steps, namely creating a pairwise comparison matrix, calculating eigenvalues and eigenvectors, consistency testing, and determining the supermatrix. while the determination method uses the Preference Ranking Organization Method for Enrichment Evaluation (PROMETHEE). PROMETHEE is a method for determining order in multicriteria analysis. In accordance with the criterion dominance theory used in PROMETHEE, a preference index is established, and the outranking values are presented graphically based on the decision-maker's preferences. JP. Brans created the PROMETHEE method for the first time in 1982, and it was published at a conference at Laval University, Quebec, by R. Nadeu and M. Landry. To provide a better description of areas that are not the same, the function of the difference in criterion values between alternatives $H(d)$ is used [34]. This has a direct relationship with the preference function P . In this study, the usual criterion is the basic type, which does not have a threshold value or tendency because the criterion value has been generated from the ANP method carried out previously.

4. Results

This research requires a decision support system to provide optimal support in decision-making regarding relevant assessment criteria. ANP and PROMETHEE offer a systematic framework for highlighting and comparing the

criteria involved in sustainable business strategy models. Through the use of this method, we can effectively identify priorities, assess their impacts, and design optimal strategies for providing renewable energy electricity supplies. The alternative models employed in this method are outlined in Figure 4 as Dedicated Sources (DS), Energy Services (ES), Power Wheeling (PW), and Co Investment (CI). DS involves an exclusive renewable energy generation business model that provides direct supply to customers, enhancing market competition, efficiency, and fairness, while requiring regulatory and grid system considerations [35]. ES integrates renewable sources into an existing supply, offering targeted energy usage monitoring and cost savings, thus linking energy and sustainability to business goals more clearly [36]. This model is further supported by analyses by Jen-Yao Chung et al. (2008), which depict green energy services as fostering new trends in renewable supply chain management [37]. PW allows for the leasing of transmission infrastructure to sell and attribute energy to specific customers, improving power systems while depending on the electrical grid's distribution and topology [38; 39]. Lastly, CI involves collaborative investment in renewable infrastructure, with revenues shared amongst stakeholders, focusing on locations with higher market value and lower equivalent costs [40].

Furthermore, the use of the PROMETHEE approach as a decision support system based on ranking can provide a more detailed, holistic, and informed view of designing and deploying sustainable business strategy models for renewable energy electricity supply. This method combines data from various aspects into one series of evaluations using assessment weights that have been obtained through the results assessment process. The weighted average of the preference function is then calculated for each alternative, and the results are represented in the form of a preference index. This index provides a consolidated picture of all assessment criteria, allowing the identification of alternatives that are preferable or more in line with existing preferences. So the final result in the calculation of leaving flow, entering flow, and net flow obtained based on this equation. The ranking of the final results is determined based on the net flow value, which is shown as follows:

Tabel 1 Result Score Leaving Flow, Entry Fow dan Nett Flow
Sub Criteria Level

Option	Leaving Flow	Entering Flow	Net Flow	Rank
Dedicated Supply	0,036	0,034	0.01	2
Energy Services	0,064	0,010	0,054	1
Power Wheeling	0,013	0,054	-0,041	4
Co Investment	0,025	0,040	-0,015	3

Criteria Level

Option	Leaving Flow	Entering Flow	Net Flow	Rank
Dedicated Supply	0,127	0,164	-0,300	3
Energy Services	0,264	0,036	0,220	1
Power Wheeling	0,064	0,218	-0,160	2
Co Investment	0,127	0,164	-0,300	4

Dimension Level

Option	Leaving Flow	Entering Flow	Net Flow	Rank
Dedicated Supply	0,333	0,667	-0,334	4
Energy Services	1,000	0,667	0,333	1
Power Wheeling	0,167	0,333	-0,166	3
Co Investment	0,500	0,167	0,333	2

In the quest to identify the optimal approach for enhancing energy services in Indonesia, a comprehensive analysis involving the calculation of sub-criteria, criteria, and dimensions was undertaken to determine the net flow value of each potential alternative. Through this meticulous evaluation, Energy Services emerged as the superior choice, distinguished by its net flow value surpassing that of competing alternatives. This pivotal distinction underscores Energy Services' capacity to revolutionize the Indonesian electricity sector. By proposing a model that indirectly supplies green energy to consumers, coupled with a sophisticated, integrated system for recording electricity production on its platform, Energy Services positions itself as a game-changer. This approach not only aligns with the sustainable energy aspirations of PLN, Indonesia's state electricity company, but also propels the sector towards a more sustainable, efficient, and user-friendly future. Through leveraging this innovative alternative, PLN can enhance its electricity supply business, driving forward the national agenda for sustainable energy consumption and contributing significantly to environment. In general, the business area used by PLN as the electricity supply business provider looks like the following picture:

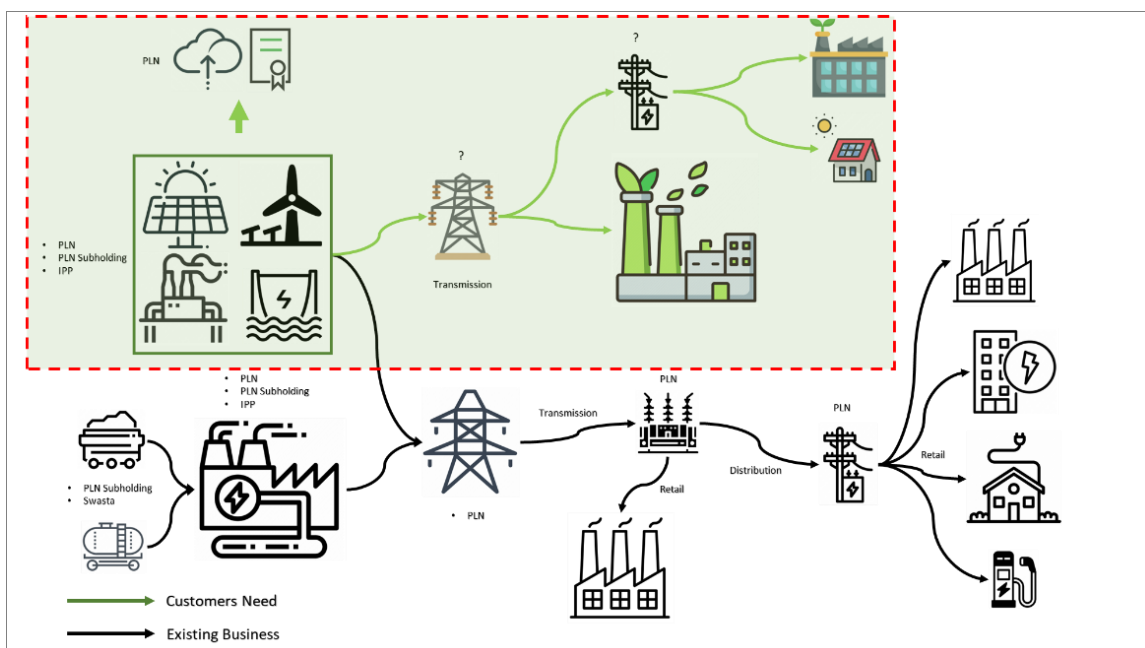


Figure 1 Energy Services Business Area

A wide range of power plants support Indonesia's sophisticated electricity infrastructure, adding to the variety of energy sources available to consumers across the country. Beyond the typical reliance on fossil fuel power generation, Indonesia is actively pressing ahead with the integration of renewable energy sources into its power infrastructure. This strategic project provides a substantial opportunity, intending to equip customers with electricity obtained from sustainable and environmentally favorable sources. While it is true that customers may not be exclusively dependent on renewable energy at present, the adoption of this forward-thinking energy service establishes a revolutionary paradigm. Through this approach, users obtain not only access to electricity but also assertive rights over the renewable energy production emerging from these specialized plants. This transactional strategy mimics successful models already operational in multiple other countries, linking Indonesia with a worldwide push to enhance the development and implementation of renewable energy alternatives. The project not only diversifies the energy portfolio but also marks a key step towards a more sustainable and resilient future for Indonesia's power sector.

This framework highlights the importance of environmental and social considerations in the energy sector, particularly in electricity supply, emphasizing the need for sustainability and community welfare [41]. It acknowledges the significant role of government policies in regulating the industry. The results of the FGD conducted are as follows:

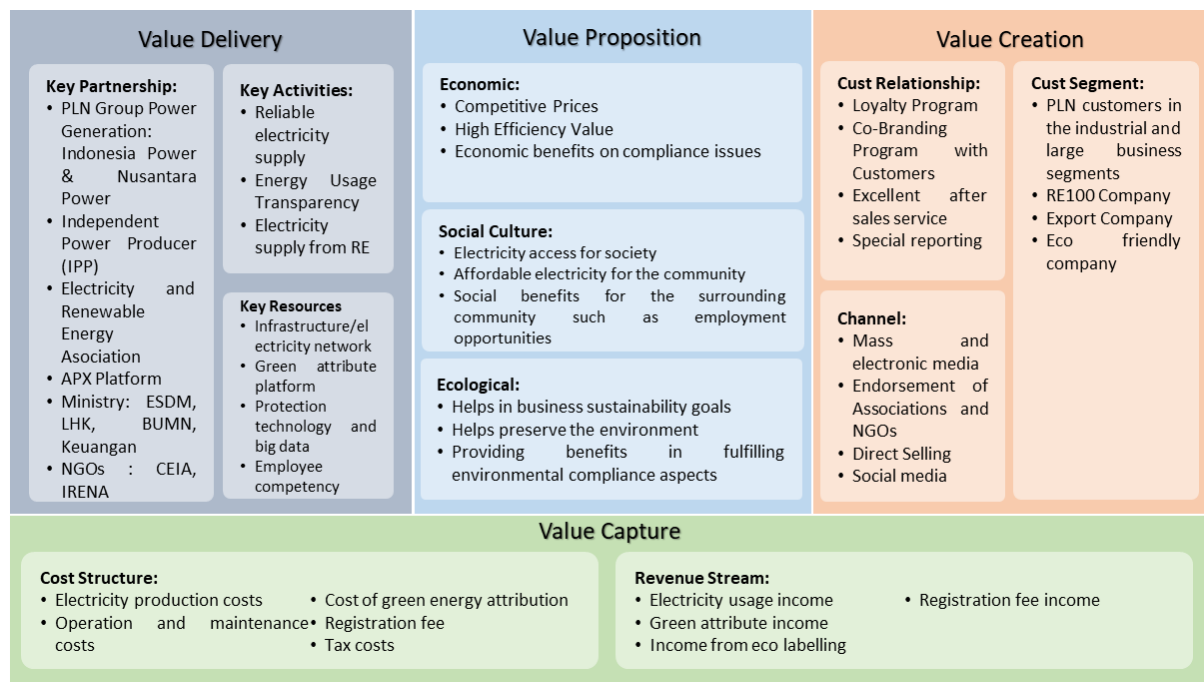


Figure 2 Sustainable Business Model Strategy

The Energy Services business model for supplying renewable energy electricity identifies several critical features. Key Partnership entails cooperation with stakeholders like Indonesia Power (IP), Nusantara Power (NP), Independent Power Producer (IPP), Electricity and EBT Association, APX Platform, and other ministries. Primary activities involve ensuring a consistent electrical supply, promoting transparency in energy consumption, and sourcing electricity from renewable sources. Essential resources consist of electrical infrastructure and networks, green attribute platforms, protection technologies, big data, and employee competency. The customer segment includes industrial and business customers, RE100 enterprises, export companies, and eco-friendly companies. Customer relationships are established through loyalty programs, co-branding initiatives, after-sales services, and specialized reporting. Channels employ many methods such as mass media, endorsements from organizations and non-governmental organizations, direct selling, and social media. Economic value is delivered through competitive pricing, high efficiency standards, and economic advantages in meeting compliance requirements. Social cultural values encompass broader energy accessibility, cost-effective electricity, and communal advantages for the local community. Ecological value is achieved by maintaining corporate sustainability, conserving the environment, and adhering to environmental regulations. The cost structure comprises expenses related to electricity production, operation, maintenance, green energy attribution, registration, and taxes. The revenue is generated from electricity usage, green attribute income, eco labeling income, and registration fees. The business model demonstrates PLN's commitment to provide sustainable electricity while emphasizing economic, social, and ecological sustainability.

In an effort to increase understanding and effectiveness of strategies in developing energy services, we will involve two complementary analytical approaches, namely the SWOT (Strengths, Weaknesses, Opportunities, Threats) and TOWS (Threats, Opportunities, Weaknesses, Strengths) matrix. A SWOT analysis will help us identify the internal and external factors influencing the Energy Services project, while the TOWS matrix will help generate a more focused strategy suited to the unique context of this business. SWOT provides insight into a company's internal strengths and weaknesses, as well as opportunities and threats from the external environment. From the SWOT results, we will develop a TOWS matrix, which consists of four strategy categories: weakness-threat (WT), weakness-opportunity (WO), strength-threat (ST), and strength-opportunity (SO). Each category will focus on utilizing a combination of SWOT elements to create an optimal strategy.

Tabel 2 SWOT Analysis & TOWS Matrix

Strengths: • Strategic collaboration with sub-holdings, Independent Power Producers, and Energy Associations. • Utilization of APX Platform, technology for monitoring and big data, increasing efficiency and predictive capabilities. • Government support through ESDM, LHK, BUMN, and Keuangan.	Weaknesses: • External risk due to external factors affecting strategy implementation. • High investment cost for energy production can affect profit margins. • Unregulated energy sector can affect regulatory changes and business model.
Opportunities: • Improved Energy Market: Global and local investments for renewable energy provide funds for local governments. • International collaboration: Use of partnerships with global organizations and international standards can enhance company reputation. • Innovation and Research: Active participation in research and development, supported by NGO and energy association, can lead to innovative solutions and competitiveness.	Threats: • Competitive Market: Rising energy sector, new and existing ones can pose threats to the market. • Unpredictable environmental factors like extreme weather conditions can affect energy production and distribution. • Rapid technological advancements can reduce existing infrastructure and require additional investment.

	Strengths	Weaknesses
Opportunities	SO Strategy: 1) Clean and Renewable Portfolio Development: Leverage strengths in strategic partnerships and technology integration to develop a clean and renewable energy portfolio, taking advantage of the growth of the renewable energy market. 2) International Expansion through Partnerships: Exploring international expansion opportunities by utilizing strategic partnerships, especially with global organizations and governments of countries that support renewable energy.	WO Strategy: 1) Diversification of Partners and Investment Sources: Overcoming dependence on external partners by looking for new partners and seeking alternative investment sources to reduce business risks. 2) Innovation through Collaboration Initiative: Exploring further collaboration with research and innovation institutions to overcome initial investment costs and improve operational efficiency.
Threats	ST Strategy: 1) Industry Leadership Position Through Technology: Using strengths in technology integration to maintain an industry leadership position and maintain competitiveness amidst intense competition. 2) Strengthening Relationships with Government: Leveraging government support to overcome regulatory uncertainty and create a stable business environment.	WT Strategy: 1) Environmental Risk Management: Implement effective risk management strategies against environmental threats, such as extreme weather changes, to protect infrastructure and production. 2) Collaboration with the Technology Industry: Forge partnerships with technology companies to overcome technological uncertainty and ensure infrastructure remains relevant.

5. Conclusion & Suggestion

The energy services business model that has been identified shows that several key components are interrelated to create value for customers, the environment, and society as a whole. With key partnerships that involve strategic partners from various sectors, key activities that focus on renewable electricity supply, and key resources that include modern infrastructure and technology, the company can carry out its operations with the aim of providing

a sustainable electricity supply. Targeted customer segments include large industrial customers, companies with sustainability commitments, and export segments. Customer relationships are maintained through loyalty programs and after-sales services to build long-term relationships. In communicating their value proposition, companies focus on economic value, social culture, and ecological value, with the aim of having a positive impact on society and the environment.

The company's cost structure and revenues are structured by considering production costs, green energy attribution, and taxes. Through diversifying investment sources and collaborating with research institutions, companies can reduce business risks and remain competitive. In addition, environmental risk management implementation strategies are the main focus, especially in facing the threat of extreme weather changes. To strengthen the Energy Services business model, the proposed strategy involves leveraging internal strengths, partner diversification, innovative collaboration, and close relationships with government. With this approach, companies can build a strong foundation for long-term growth, respond to market dynamics, and maintain operational continuity amidst external changes.

The research suggests that a sustainable business model framework in the electricity sector, particularly in renewable energy services, can provide a solid foundation for sustainable business strategies. It emphasizes the importance of identifying key dimensions, criteria, and sub-criteria to create added value for customers, the environment, and society. The energy services business model is a reliable foundation for renewable electricity provision. Implementing this model requires considering the latest technology and strategic partnerships to increase operational efficiency and business sustainability. Further research should validate business models in other industrial contexts, analyze demand or market, and integrate other research methods.

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