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A Business Model Innovation Strategy for PT PLN (Persero) to Address Low Utilization of SPKLU Assets Through Standardized Charging Hubs and Asset Reallocation in DKI Jakarta

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***Abstract**; Indonesia's rapid adoption of electric vehicles (EVs) has increased the importance of reliable public charging infrastructure. PT PLN (Persero) has expanded its Public Electric Vehicle Charging Station (SPKLU) network in DKI Jakarta; however, expansion has not generated proportional revenue growth. PLN's internal data indicate that SPKLU revenue reached approximately IDR 14.59 billion from January to November 2025, while revenue growth declined from approximately 375% in 2024 to 16% in 2025. This study examines the factors underlying uneven SPKLU revenue, evaluates expansion strategies, and proposes a redesigned business model to improve asset utilisation and revenue sustainability. A convergent mixed-methods design was employed. The quantitative phase analysed PLN operational data from 2021 to November 2025 and survey responses from 399 EV users in DKI Jakarta using descriptive statistics, cross-tabulation, Pearson's chi-square test, Cramer's V, and multiple linear regression. The qualitative phase involved interviews with PLN representatives, a business partner, and EV users, supported by document analysis, regulatory review, competitor assessment, and international benchmarking. Findings indicate that administrative city is not significantly associated with SPKLU usage frequency, whereas home-charging availability is strongly associated with public-charging frequency. The regression model explained 62.5% of the variance in usage intention, with supporting facilities showing the largest relative contribution. The study proposes a demand-led and standardised SPKLU portfolio comprising Medium and Mega Charging Hubs, supported by asset reallocation, digital enhancement, partnership strengthening, and continuous performance monitoring.*

INTRODUCTION

The transportation sector is a major contributor to global greenhouse-gas (GHG) emissions, particularly through road transportation. In developing countries, transport-related emissions are

expected to increase significantly by 2030. Indonesia has therefore committed to reducing GHG emissions under the Paris Agreement and its Enhanced Nationally Determined Contribution, with transportation identified as an important sector for decarbonisation. The transition from fossil fuels to clean energy, particularly through electric vehicles (EVs), is consequently becoming an important component of Indonesia's low-carbon development strategy.

Indonesia has established a comprehensive regulatory framework to accelerate battery electric vehicle (BEV) adoption. Presidential Regulation No. 55 of 2019 established the national EV development roadmap and assigned PT PLN (Persero) an important role in providing public charging infrastructure. This framework was strengthened through Minister of Energy and Mineral Resources Regulation No. 1 of 2023, which regulates licensing, tariffs, technical standards, and partnership arrangements for Public Electric Vehicle Charging Stations (SPKLU). Various fiscal and non-fiscal incentives have also been introduced to stimulate EV demand and investment, although some incentives are subject to specific implementation periods.

The development of EVs is closely connected with Indonesia's renewable-energy transition. The increasing use of solar, wind, biomass, and geothermal energy can support EV charging while reducing dependence on fossil fuels. The integration of EVs with renewable electricity and solar-powered charging systems can further strengthen the environmental benefits of transport electrification. DKI Jakarta represents a strategic location for studying EV adoption and public charging infrastructure. As Indonesia's major economic and population centre, Jakarta has a high concentration of vehicles, relatively strong purchasing power, and increasing demand for sustainable urban mobility. Government policies, including the exemption of electric vehicles from the odd-even traffic restriction, have increased the attractiveness of EVs for daily transportation. The development of electric buses, SPKLU networks, and other EV-related infrastructure has also strengthened Jakarta's position as the leading market for electric mobility.

Despite these favourable conditions, the expansion of SPKLU infrastructure requires appropriate demand assessment and asset-management strategies. Differences in location, charger type, accessibility, utilisation, and supporting facilities can affect transaction volumes and revenue performance. Therefore, evaluating SPKLU utilisation and developing an appropriate business model are essential to ensure that infrastructure expansion generates sustainable economic value while supporting Indonesia's transition toward low-carbon transportation.

Interest in electric vehicles (EVs) in Jakarta is increasing rapidly. A study found an emerging EV market, while by 2025 Jakarta had approximately 77,454 registered electric cars, making it Indonesia's largest EV market (Sateriano, 2023; MetroTV News, 2025). Rising EV ownership has also increased demand for public charging infrastructure, with SPKLU utilisation in Jakarta increasing by 147% in May 2024 compared with the same month in 2023 (CNN Indonesia, 2024). Indonesia has strengthened its EV ecosystem through Presidential Regulation No. 55 of 2019 and Presidential Regulation No. 79 of 2023, supported by investment incentives and technical regulations for charging infrastructure. These policies provide fiscal and non-fiscal incentives, encourage local EV production, and establish standards for SPKLU licensing, tariffs, safety, and operations (Republic of Indonesia, 2019, 2023; Ministry of Investment, 2023; Ministry of Energy and Mineral Resources, 2023).

PT PLN (Persero) plays a central role in implementing this policy by developing and operating SPKLU infrastructure. By March 2025, Indonesia had 3,772 SPKLU units, while PLN targeted 5,810 units by the end of 2025. PLN has also established partnerships with private companies, automotive manufacturers, and property developers to expand charging facilities in strategic locations (PT PLN (Persero), 2024; Ministry of Energy and Mineral Resources, 2024).

Despite rapid infrastructure expansion and increasing EV adoption, PLN's internal data indicate uneven SPKLU utilisation and slowing revenue growth across DKI Jakarta. This gap between infrastructure availability and revenue-generating utilisation provides the primary empirical motivation for this study.

LITERATURE REVIEW

Theoretical Foundation

This chapter presents the theoretical foundations relevant to the study, particularly Business Model Innovation and the Business Model Canvas, which are used to analyse and develop strategies for improving SPKLU asset utilisation and revenue sustainability.

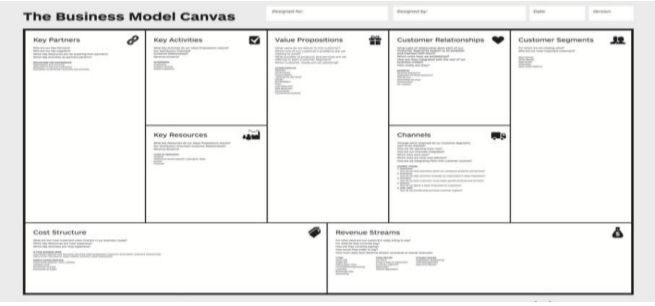
Business Model Innovation

A business model explains how an organisation creates, delivers, and captures value (Osterwalder & Pigneur, 2010). It encompasses the value proposition, resources, partnerships, activities, customer relationships, cost structure, and revenue mechanisms that enable an organisation to achieve sustainable performance. Business Model Innovation involves redesigning these elements to respond to changing markets, competition, technology, and customer needs (Chesbrough, 2010; Teece, 2010; Taran et al., 2015).

In the EV ecosystem, a business model facilitates interactions among EV users, electricity providers, charging operators, retailers, regulators, and other stakeholders to create and capture value within the electricity market (Anggraini et al., 2025). Therefore, Business Model Innovation is relevant for PLN in addressing uneven SPKLU utilisation by aligning charging services, infrastructure, partnerships, and revenue mechanisms with customer demand.

Business Model Canvas

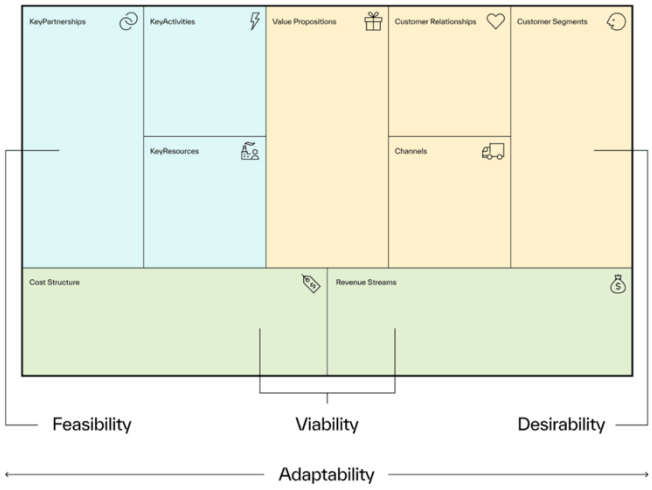
The Business Model Canvas (BMC) is a visual strategic management framework developed by Osterwalder and Pigneur (2010) to describe how an organisation creates, delivers, and captures value through nine interconnected elements. These elements consist of Customer Segments, Value Propositions, Channels, Customer Relationships, Revenue Streams, Key Resources, Key Activities, Key Partnerships, and Cost Structure. The framework can be grouped into four main dimensions: customers, offering, infrastructure, and financial aspects. In the context of SPKLU, the BMC helps identify customer needs, charging-service value propositions, operational resources, strategic partnerships, distribution channels, costs, and potential revenue sources. It therefore provides a practical framework for designing a more demand-oriented and sustainable SPKLU business model.



Source: Osterwalder & Pigneur, 2010.

Figure 1. Business Model Innovation Framework

The Business Model Innovation Framework extends the original Business Model Canvas from a descriptive tool into a more evaluative framework. It assesses business models through three key dimensions: desirability, feasibility, and viability, supported by adaptability as an overarching dimension. This framework enables organisations to evaluate customer needs, operational capabilities, financial sustainability, and the ability to adapt and innovate in response to changing market conditions (Osterwalder et al., 2014).

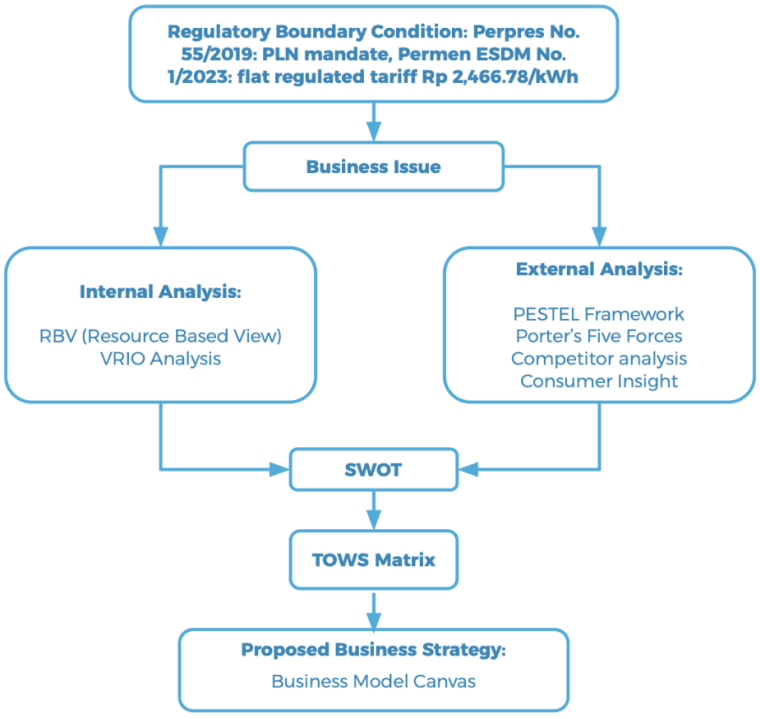


Source: Osterwalder et al., 2014.

Figure 2. Business Model Innovation Framework and Business Model Canvas

The Business Model Innovation Framework evaluates a business model through four dimensions: desirability, feasibility, viability, and adaptability (Osterwalder et al., 2014). Desirability focuses on customer needs through Customer Segments, Value Propositions, Channels, and Customer Relationships. Feasibility concerns the organisation's operational capabilities through Key Resources, Key Activities, and Key Partnerships. Viability evaluates financial sustainability through Revenue Streams and Cost Structure, while adaptability reflects the ability of the business model to respond to market, technological, and customer changes.

The Business Model Canvas (BMC) consists of nine interconnected elements: Customer Segments, Value Propositions, Channels, Customer Relationships, Revenue Streams, Key Resources, Key Activities, Key Partnerships, and Cost Structure (Osterwalder & Pigneur, 2010). The BMC is relevant to this study because PLN's SPKLU challenge involves more than infrastructure expansion. It requires alignment among customer needs, charger types and locations, partnerships, operational activities, demand generation, costs, and revenue mechanisms. Therefore, the BMC serves as the final strategic framework for integrating the proposed SPKLU business model and improving asset utilisation and revenue sustainability.



Source: Author, 2026.

Figure 3. Conceptual Framework

The Conceptual Framework illustrates the relationships among the variables and provides a structured guide for the research analysis (Swarjana, 2012). This study combines quantitative and qualitative approaches to evaluate PT PLN (Persero)'s SPKLU business strategy in DKI Jakarta. The quantitative component tests five hypotheses regarding factors influencing PLN SPKLU

Usage Intention:

1. H1: Accessibility positively influences PLN SPKLU Usage Intention.
2. H2: Charging Speed positively influences PLN SPKLU Usage Intention.
3. H3: Reliability positively influences PLN SPKLU Usage Intention.
4. H4: Supporting Facilities positively influence PLN SPKLU Usage Intention.
5. H5: Digital and Payment Convenience positively influences PLN SPKLU Usage Intention.

These variables represent important aspects of the customer experience, including ease of reaching charging stations, charging duration, equipment reliability, supporting amenities, and digital-payment convenience.

The qualitative component uses RBV and VRIO to assess internal resources and capabilities, while PESTEL, Porter's Five Forces, competitor analysis, and consumer insights examine external conditions. The findings are synthesised through SWOT and the TOWS Matrix to develop strategic alternatives, while the Business Model Canvas integrates these findings into the proposed SPKLU business model.

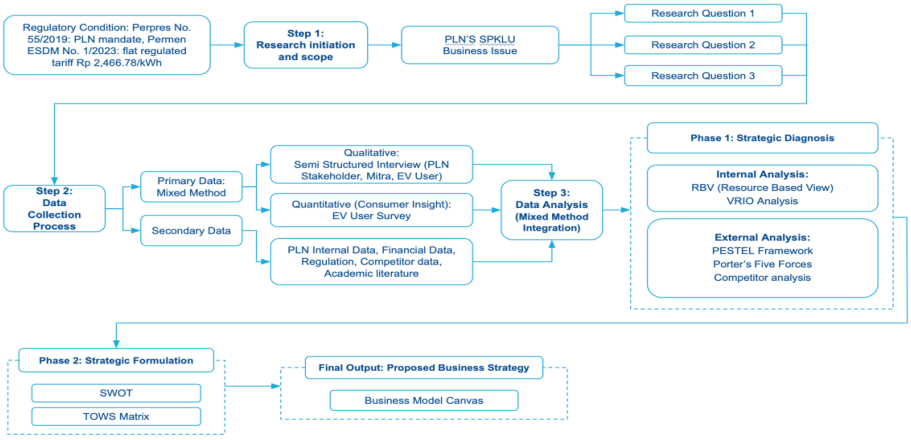
Thus, the conceptual framework connects customer-related factors, internal capabilities, external conditions, and strategic analysis to formulate a demand-oriented strategy for improving SPKLU asset utilisation and revenue sustainability.

Research Methodology

Research Design

This study employs a mixed-methods research design that combines quantitative and qualitative approaches to provide a comprehensive understanding of the SPKLU business challenges faced by PT PLN (Persero) in DKI Jakarta (Creswell & Plano Clark, 2018). The quantitative component analyses PLN's historical SPKLU operational data and survey responses from EV users. Operational data are used to evaluate transactions, electricity consumption (kWh), revenue, charger types, and location differences, while the survey identifies customer preferences and factors influencing SPKLU usage.

The qualitative component uses semi-structured interviews with relevant SPKLU stakeholders to explore organisational capabilities, operational conditions, partnerships, regulations, competition, and customer experiences that cannot be fully captured through quantitative data. The findings from both approaches are subsequently integrated into a strategic diagnosis. Internal factors are assessed using Resource-Based View (RBV) and VRIO, while external conditions are analysed using PESTEL, Porter's Five Forces, and competitor analysis. The results are synthesised through SWOT analysis and translated into strategic alternatives using the TOWS Matrix. Finally, the selected strategy is incorporated into a Business Model Canvas (BMC) to formulate the proposed SPKLU business model. The research process consists of the following stages: data collection, quantitative and qualitative analysis, findings integration, strategic diagnosis, strategy formulation, and Business Model Canvas development.



Source: Author, 2026.

Figure 4. Research Design

The research focuses on PT PLN (Persero)'s SPKLU network in DKI Jakarta within the regulatory framework of Presidential Regulation No. 55 of 2019 and Minister of Energy and Mineral Resources Regulation No. 1 of 2023. The unit of analysis covers SPKLU site performance, charger type, location characteristics, administrative city, and partnership factors across the five administrative cities of DKI Jakarta.

Data Collection Method

This study uses primary and secondary data. Primary data were obtained through an online questionnaire and semi-structured interviews, while secondary data were collected from PLN operational records, internal documents, regulations, industry reports, competitor information, and

academic literature. The combination of these sources provides quantitative evidence, stakeholder perspectives, and contextual information for analysing SPKLU performance and business strategy.

Primary Data

Primary data consist of quantitative survey data and qualitative interview data. The quantitative data were collected through a Google Forms questionnaire distributed to EV users in DKI Jakarta using purposive non-probability sampling. Respondents were at least 17 years old, owned or regularly used a four-wheeled EV, and conducted their primary activities in DKI Jakarta. The questionnaire covered respondent characteristics, EV usage, home-charging availability, public-charging frequency, preferred locations and charger types, charging speed, reliability, supporting facilities, payment convenience, digital experience, and intention to use PLN SPKLU. Perception-based items were measured using a five-point Likert scale, ranging from strongly disagree to strongly agree.

RESULTS AND DISCUSSION

This chapter presents the research findings and discusses the evidence used to address the research questions regarding PLN's SPKLU revenue performance in DKI Jakarta. The analysis draws on operational data, EV-user survey responses, semi-structured interviews, and relevant supporting documents to identify the factors underlying variations in SPKLU performance. The analysis covers revenue, transaction volume, electricity sales, charger types, location characteristics, partnership schemes, customer behaviour, and stakeholder perspectives. These findings are subsequently integrated to provide an evidence-based assessment of PLN's SPKLU business performance. The results serve as the foundation for the SWOT and TOWS analyses, the development of the proposed Business Model Canvas, and the formulation of the business solution and implementation plan presented in the subsequent sections.

Analysis

This section evaluates the operational performance, asset utilisation, and productivity of PLN's SPKLU network using transactions, electricity consumption (kWh), and charging revenue as key indicators.

SPKLU PLN Document Analysis

A descriptive analysis of PT PLN (Persero) UID Jakarta Raya's internal SPKLU data was conducted to identify factors associated with uneven charging revenue across DKI Jakarta. The analysis covers transactions, kWh consumption, charging revenue, charger type, administrative city, location category, and partnership scheme, using January–November data for each year to ensure comparability. Charging revenue represents income from charging transactions before deducting electricity costs, revenue sharing, maintenance, depreciation, taxes, and other expenses. Therefore, the analysis focuses on revenue-generating performance rather than profitability. The revenue calculation is expressed as:

$$\text{Charging Revenue} = \text{Transactions} \times \text{Average kWh per Transaction} \times \text{Charging Tariff}$$

Because charging tariffs were relatively uniform, differences in revenue were primarily driven by transaction volume and electricity delivered. Historical data from June 2021 to November 2025 were used to analyse overall trends, while the detailed analysis focuses on 287 SPKLU charging units across the five administrative cities of DKI Jakarta. These 287 units form the basis for analysing performance by city, charger type, location, and partnership scheme.

Implications for Uneven Charging Revenue

The internal asset data indicate three main factors contributing to uneven SPKLU revenue:

1. Uneven asset distribution: South Jakarta had more than one-third of the SPKLU units, while West Jakarta had only 12.5%. However, a larger number of chargers did not necessarily result in higher utilisation or revenue.
2. Differences in charger composition: Medium chargers dominated the network, while some cities had higher proportions of ultra-fast chargers. Charger speed may influence charging duration, customer volume, electricity consumption, and revenue.
3. Variation in location characteristics: SPKLU sites serve different customer segments across offices, commercial areas, rest areas, and transport facilities. Mismatches between charger type and location function may result in low utilisation.

Partnership schemes may also affect performance, although their impact cannot be confirmed without detailed transaction, revenue, investment, and cost data. Overall, uneven revenue appears related to asset distribution, charger utilisation, location characteristics, and partnership structures.

Quantitative Survey Analysis

The quantitative survey examined EV-user charging behaviour and the relationship between SPKLU service attributes and PLN SPKLU Usage Intention. Data were collected through Google Forms using purposive sampling from eligible EV users in DKI Jakarta. The analysis included data screening, respondent profiling, descriptive statistics, Cronbach's alpha, Pearson correlation, cross-tabulation, chi-square, Cramer's V, exploratory factor analysis, multiple linear regression, and diagnostic tests. The independent variables were Accessibility (X1), Charging Speed (X2), Reliability (X3), Supporting Facilities (X4), and Digital and Payment Convenience (X5), while PLN SPKLU Usage Intention (Y) was the dependent variable.

Data Screening

Of 401 responses, no missing or duplicate data were identified. Two respondents were excluded because their primary activity areas were outside DKI Jakarta. Consequently, 399 eligible responses were retained for the final analysis.

Table 1. Survey Data Screening Results

Screening Criterion	Responses (n)
Initial Google Forms responses	401
Responses with missing values	0
Duplicate submissions	0
Responses excluded for non-DKI Jakarta activities	2
Final Analytical Sample	**399**

Source: Author's analysis based on Google Forms survey data processed using Python (2026).

The data-screening process identified 401 initial responses. No missing values or duplicate submissions were found. Two responses were excluded because the respondents' primary activities were outside DKI Jakarta. Therefore, 399 valid responses were retained for the final statistical analysis.

Table 2. Respondent Profile

Characteristic	Category	Frequency (n)	Percentage (%)
Primary Activity Area	South Jakarta	263	65.9
	Central Jakarta	58	14.5
	West Jakarta	41	10.3
	East Jakarta	22	5.5
	North Jakarta	15	3.8
Home-Charging Access	No	263	65.9
	Yes	136	34.1
Public-Charging Frequency	Several times per week	254	63.7
	1–3 times per month	133	33.3
	Almost every day	12	3.0
PLN SPKLU Usage in the Previous Three Months	Several times per week	242	60.7
	1–3 times per month	131	32.8
	Approximately once per week	14	3.5
	Almost every day	12	3.0
Most-Used PLN Charger	DC Ultra-Fast Charging	339	85.0
	DC Fast Charging	60	15.0
Main Charging Location	Office Charging Station	235	58.9
	Mall or Public Facility	124	31.1
	Home Charging	40	10.0

Source: Author's analysis based on Google Forms survey data processed using Python (2026).

The respondent profile shows that most participants conducted their primary activities in South Jakarta (65.9%). Most respondents (65.9%) did not have access to home charging, indicating a relatively high dependence on public charging infrastructure. Public charging was commonly used several times per week (63.7%), while 60.7% reported using PLN SPKLU several times per week during the previous three months. DC Ultra-Fast Charging was the most-used charger type (85.0%), and office charging stations were the main charging location (58.9%). These characteristics indicate strong demand for accessible, fast, and conveniently located public charging services among the surveyed EV users.

Table 3. Construct-Level Descriptive Statistics

Construct	Mean	Median	Standard Deviation	Rank
Supporting Facilities (X4)	4.368	4.500	0.427	1
Reliability (X3)	4.343	4.333	0.445	2
Usage Intention (Y)	4.325	4.500	0.417	3
Charging Speed (X2)	4.296	4.500	0.426	4
Digital and Payment Convenience (X5)	4.292	4.400	0.424	5
Accessibility (X1)	4.221	4.250	0.365	6

Source: Author's analysis based on Google Forms survey data processed using Python (2026).

The descriptive statistics indicate that all constructs received high mean scores, ranging from 4.221 to 4.368 on the five-point Likert scale. Supporting Facilities (X4) recorded the highest mean (4.368), followed by Reliability (X3) at 4.343 and Usage Intention (Y) at 4.325. Meanwhile, Accessibility (X1) had the lowest mean (4.221), although it remained within the high category. The relatively low standard deviations (0.365–0.445) indicate that respondents' perceptions were generally consistent across the measured constructs.

Chi-Square and Cross-Tabulation Results

Cross-tabulation and Pearson's chi-square tests were used to examine whether charging behaviour differed across key respondent categories. The strongest association concerned home-charging access and public-charging frequency. Users without home charging relied on public charging substantially more often, whereas the relationship between broad administrative area and PLN SPKLU usage frequency was not statistically significant. Cramer's V was used to assess association strength.

Table 4. Summary of Chi-Square Tests

Variables	Chi-square	df	p-value	Cramer's V	Interpretation
Administrative area and PLN SPKLU usage frequency	10.35	12	0.586	0.093	Not significant; negligible
Home-charging access and public-charging frequency	287.59	2	<0.001	0.849	Significant; strong

Source: Author's analysis based on Google Forms survey data processed using Python (2026).

The home-charging result, $\chi^2(2) = 287.59$, $p < 0.001$, Cramer's V = 0.849, confirms home-charging access as an important segmentation variable for public-charging demand. In contrast, the administrative-area result was not significant, indicating that broad city boundaries alone do not adequately explain individual SPKLU usage frequency.

Multiple Linear Regression and Hypothesis Testing

Multiple linear regression was used to estimate the relative contribution of the five service attributes to PLN SPKLU Usage Intention while controlling for the other predictors. The overall model was statistically significant and explained 62.5% of the variance in Usage Intention.

Table 5. Multiple Linear Regression and Hypothesis Testing Results

Hypothesis	Predictor	B	Beta	p-value	Decision
H1	Accessibility (X1)	0.1339	0.117	0.027	Supported
H2	Charging Speed (X2)	0.1841	0.188	<0.001	Supported
H3	Reliability (X3)	0.2065	0.208	<0.001	Supported
H4	Supporting Facilities (X4)	0.3010	0.308	<0.001	Supported
H5	Digital and Payment Convenience (X5)	0.0808	0.084	0.107	Not supported

Model statistics: $R^2 = 0.625$; adjusted $R^2 = 0.621$; $F(5, 393) = 131.20$; $p < 0.001$; $N = 399$.
Source: Author's analysis based on Google Forms survey data processed using Python (2026).

Supporting Facilities showed the largest relative contribution ($\beta = 0.308$), followed by Reliability ($\beta = 0.208$), Charging Speed ($\beta = 0.188$), and Accessibility ($\beta = 0.117$). Digital and Payment Convenience was not statistically significant after the other service attributes were controlled ($p = 0.107$). These results support H1–H4, while H5 was not supported.

Qualitative and Strategic Findings

The qualitative findings from interviews with PLN representatives, a SPKLU business partner, and EV users were integrated with internal documents, regulatory review, competitor assessment, and international benchmarking. The evidence consistently indicated that charger availability alone does not generate transactions. Charging revenue depends on the alignment of

customer demand, site function, parking duration, charger category, accessibility, operating hours, equipment reliability, supporting facilities, digital information, payment convenience, maintenance response, and partnership feasibility.

The internal RBV and VRIO assessment indicates that PLN possesses a strong strategic foundation through its electricity infrastructure, charging assets, operational data, technical capabilities, institutional role, digital resources, and partnership schemes. However, the external PESTEL, Porter's Five Forces, and competitor analyses show that these resources must operate within regulated tariffs, growing competition, changing EV-user expectations, and site-specific demand conditions. The SWOT and TOWS synthesis therefore shifts the strategic emphasis from infrastructure quantity toward demand-led site selection, charger–location fit, reliable customer journeys, active asset reallocation, and performance-based partnership governance.

Based on this synthesis, the proposed strategy uses two standardised service configurations. The SPKLU Medium Charging Hub combines Standard and Medium Chargers at residential and destination-based locations where vehicles remain parked longer. The SPKLU Mega Charging Hub combines Fast and Ultra-Fast Chargers at high-traffic, direct-access, twenty-four-hour locations for time-sensitive private EV users. Existing low-utilisation equipment should be considered for reallocation before additional charging assets are purchased.

Table 6. Proposed SPKLU Hub Business Model Canvas

BMC Element	Proposed SPKLU Hub Business Model
Customer Segments	Public-charging-dependent residential users; destination-based private EV users; time-sensitive private EV users.
Value Propositions	The right charger at the right location for the customer's charging situation: affordable and convenient longer-dwell charging through Medium Hubs, and rapid, reliable, continuously accessible charging through Mega Hubs.
Channels	Dedicated SPKLU digital application, PLN Mobile integration, digital maps, on-site signage, property partners, automotive dealers, EV communities, and customer communication channels.
Customer Relationships	Digital self-service, charger-status and charging notifications, queue/reservation functions where applicable, customer support, complaint resolution, service recovery, and loyalty or recurring-use programmes.
Revenue Streams	Charging revenue as the primary stream, with potential complementary income from permitted reservation/idle fees, parking collaboration, advertising and sponsorship, automotive collaboration, and supporting commercial services.
Key Resources	Electricity network, charging equipment, strategic sites, operational data, technical capabilities, digital systems, brand and institutional authority, and partnership network.
Key Activities	Demand-led site selection, charger allocation and reallocation, charging operations, preventive and corrective maintenance, digital-service management, customer communication, partner management, and site-level performance monitoring.
Key Partnerships	Property and land partners, charging-equipment manufacturers/investors, installation contractors, maintenance providers, parking operators, automotive companies, and other ecosystem partners under performance-based governance.
Cost Structure	Charging equipment, electricity connection, electrical and civil installation, operation and maintenance, digital-system support, site requirements, facilities, and partnership-related costs.

Source: Author's synthesis based on the integrated quantitative, qualitative, and strategic analyses (2026).

The proposed Business Model Canvas reframes PLN's SPKLU network as an integrated, standardised, and data-managed asset portfolio. The two hub configurations serve different charging situations while sharing PLN's electricity infrastructure, digital ecosystem, customer-

service standards, maintenance governance, partnership mechanisms, and performance-management system.

CONCLUSION

The findings show that uneven SPKLU revenue is mainly associated with differences in asset distribution, charger configuration, site characteristics, and customer charging behaviour. PLN's SPKLU revenue reached approximately IDR 14.59 billion in January–November 2025, although revenue growth slowed considerably. Home-charging availability was strongly associated with public-charging frequency, while the five service constructs explained 62.5% of the variation in SPKLU Usage Intention, with Supporting Facilities showing the largest relative contribution.

PLN should therefore adopt a demand-led and performance-based expansion strategy. The study proposes two standardised configurations: the SPKLU Medium Charging Hub for residential and destination-based users and the SPKLU Mega Charging Hub for time-sensitive users requiring fast charging. An initial portfolio of 10 Medium and 10 Mega Charging Hubs is proposed across DKI Jakarta, supported by asset reallocation, selective partnerships, and stronger digital services.

The proposed Business Model Canvas transforms SPKLU management into an integrated, standardised, and data-driven asset portfolio. The strategy focuses on serving the right customer with the right charger at the right location while maintaining electricity charging as the primary revenue source and exploring complementary revenue opportunities.

PLN should prioritise asset utilisation over infrastructure quantity, reallocate low-utilisation chargers before purchasing new units, standardise charging hubs, use site-level demand analysis, strengthen digital services, apply performance-based partnerships, and continuously monitor transactions, kWh, revenue, utilisation, availability, and customer experience. Overall, the recommended strategy is to provide "the right charger, at the right location, for the right customer" to achieve sustainable SPKLU utilisation and revenue growth.

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