Quick win Solution with Green Economy to Improve Customer Satisfaction at PLN UP3 Offices

Ali Ali* and Muhammad Toaha

Hasanuddin University, Makassar, Indonesia
*ali23a@student.unhas.ac.id

Abstract. The purpose of this study is to evaluate the impact of PLN UP2D South Sulawesi, Southeast Sulawesi, and West Sulawesi (Sulselrabar) on customer satisfaction index at PLN UP3s spread across the Sulselrabar region. This study focuses on the Quick win solutions used by PLN UP2D to improve customer service, operational efficiency, and customer satisfaction index. To measure changes in customer satisfaction, a quantitative survey was used to collect data in the form of questionnaires in the first and second semesters of 2024. The results of the research show that customer satisfaction can be significantly increased through improved communication, employee training, and the application of technology. The principles of green economy can also improve business sustainability and profitability. This research is expected to help PLN UP2D management throughout Indonesia to become an effective standard in improving customer satisfaction, as well as encouraging policies that support the use of renewable energy and operational efficiency in all PLN distribution units.

Keywords: Customer Satisfaction Index, Efficiency, Green Economy, Quick win Solutions, PLN

1 Introduction

The concept of green economy has become highly relevant in business management, including the energy distribution sector, because of increased global awareness of environmental damage and climate change. Green economy is an economic development model that aims to balance environmental sustainability, social welfare, and economic growth. According to this model, companies are expected to operate in a way that not only generates profits but also reduces negative impacts on the environment by utilizing resources efficiently, reducing carbon emissions, and using environmentally friendly technologies. Research by [1] shows the importance of internet penetration in reducing carbon emissions and building environmental sustainability, the relevance of which is also evident in the energy and green economy sectors. [2] highlights the economic and environmental impacts of emerging financial risks, which are increasingly relevant in the energy sector, where more efficient resource management can reduce negative impacts on the environment. [3] also emphasizes the importance of waste management strategies to achieve carbon

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neutrality, a concept that is highly relevant to the energy sector's efforts to reduce its carbon footprint and implement green economy principles.

The energy distribution sector in Indonesia is an important component in providing efficient and environmentally friendly electricity services. As part of the government's efforts to improve energy sustainability, PLN, the largest electricity company in Indonesia, continues to innovate in managing energy distribution, including the application of green economy principles that aim to reduce negative impacts on the environment and improve operational efficiency. This approach involves more efficient energy resource management, the use of renewable energy, and the application of environmentally friendly technologies. Research by [4] shows that the application of renewable energy and technological innovation can contribute significantly to reducing the ecological footprint and improving energy sustainability in ASEAN countries, the relevance of which can also be applied to the energy distribution sector in Indonesia. PLN UP2D South Sulawesi, Southeast Sulawesi, and West Sulawesi (Sulselrabar), as one of the PLN units responsible for electricity distribution in the Sulselrabar region, plays a role in implementing this policy with a focus on providing reliable and environmentally friendly electricity services.

PLN UP2D Sulselrabar is a state-owned company that manages the electricity distribution network in the regions of South, Southeast, and West Sulawesi. As part of its efforts to improve customer satisfaction in these regions, PLN UP2D focuses on managing an efficient and environmentally friendly energy distribution system. The company provides electrical equipment maintenance services, including motorized LBS, Recloser, and cubicles, which ensure fast and efficient recovery from power outages. By utilizing SCADA technology for monitoring and controlling the distribution system, PLN UP2D Sulselrabar can optimize the quality of service to customers. In addition, the application of green economy principles in its operations—such as the use of renewable energy, reduction of carbon footprint, and improvement of energy efficiency—aims to support long-term sustainability and contribute to customer satisfaction. This study will evaluate the extent to which the Quick win Solutions implemented by PLN UP2D can improve customer satisfaction at PLN UP3 across of Sulselrabar, by utilizing environmentally friendly technologies and practices.

In this era of rapid technological development, energy distribution management has become an increasingly complex challenge. PLN UP2D Sulselrabar, as a unit that plays an important role in regulating the electricity distribution system in the Sulselrabar region, continues to strive to improve service quality and operational efficiency. One way to evaluate and improve service performance is by measuring the customer satisfaction index at PLN UP3 in the region. However, to date, there has been no standard measurement method implemented by PLN UP2D throughout Indonesia to measure customer satisfaction levels. In addition, there are no clear development measures based on survey results to utilize Quick win Solutions based on green economy principles to improve service quality. This study aims to understand how the implementation of Quick win Solutions and green economy principles can contribute to improving the customer satisfaction index at PLN UP3 Sulselrabar. This research will also identify factors that affect customer satisfaction and provide recommendations regarding steps that need to be maintained or improved to enhance overall service

quality. By analyzing the impact of the Quick win Solutions that have been implemented, this research is expected to provide insights into effective ways to improve service quality using environmentally friendly technology and become an assessment standard for more efficient operational strategies.

A previous study by [5] showed that the implementation of management information systems and service digitization, such as PLN Mobile and Contact Centre 123, had a positive impact on service quality improvement. Another study by [6] found that knowledge sharing and work motivation significantly affected employee job satisfaction, which in turn contributed to improved service performance for customers. The analysis results show that the combination of motivation and a culture of knowledge sharing contribute 69.4% to job satisfaction, so companies need to encourage internal information sharing practices to create more responsive and collaborative services.

Meanwhile, a journal by [7] found that the implementation of innovative digital-based programs and green economy principles had a direct impact on increasing customer satisfaction index. The implementation of strategies such as quick response, energy efficiency programs, and strengthening cooperation with customers was considered effective in responding to the challenges of sustainability-based services.

Although there is a lot of literature that measure customer satisfaction with PLN, there is still only a few that focus on satisfaction with services between PLN units, especially in the case of the Sulselrabar region, which focuses on the context and scope of the study on PLN UP2D and UP3 in the Sulselrabar region, with an emphasis on the influence of Quick win Solutions and the integration of green economy principles as a strategy to increase customer satisfaction. This study also explores the factors that drive and inhibit changes in customer satisfaction and offers strategic steps to achieve superior service standards in the future.

2 Literature Review

2.1 Quick win Solution

According to [8], "Quick Response in operational management serves as a rapid solution that can have a significant impact on business process effectiveness, increase service speed, and improve customer perception of service quality." [5] also emphasizes that "the implementation of service digitalization such as PLN Mobile and Contact Centre 123, which are categorized as Quick win, has a positive impact on improving service quality, particularly in terms of responsiveness and transparency." In line with this, [7] found that "digital-based innovative programs and quick response strategies have proven to be effective in increasing customer satisfaction through strengthening cooperation and energy efficiency."

In conclusion, Quick win Solutions is a straightforward quick-fix strategy that has a significant impact on improving customer satisfaction index, particularly through accelerated recovery from disruptions, service transparency, and operational efficiency.

2.2 SCADA Technology

According to [9], "the implementation of SCADA technology in energy distribution systems enables remote control, real-time monitoring, and reduced risk of disruption, which ultimately improves reliability and service quality." [5] explains that "although service digitization provides tangible benefits, system integration and human resource training in the use of SCADA technology remain challenges that need to be addressed to achieve optimal results." [7] also states that, "the use of SCADA equipment such as motorized LBS, reclosers, and cubicles plays an important role in accelerating network normalization and providing a better service experience for customers."

Therefore, SCADA technology can be recognized as a crucial component in modern energy distribution systems that supports rapid response, operational efficiency, and increased customer satisfaction.

2.3 Green Economy in Energy Sector

[5] explains that "green technology through the application of renewable energy, energy efficiency, and carbon emission reduction not only improves the reliability of the energy distribution system but also strengthens the company's image as a sustainable energy provider." [10] further argues that "the integration of green economy principles into energy company strategies can support long-term profitability while reducing environmental impact through the use of environmentally friendly technologies." Furthermore, [7] shows that, "the implementation of green economy-themed programs in the energy distribution sector contributes significantly to increasing the customer satisfaction index and business sustainability." [11] emphasizes that "the integration of green economy principles into the energy sector not only improves energy efficiency but also contributes to creating a positive impact on the environment and society through enhanced sustainability practices."

[12] states that "adopting renewable energy solutions in the energy distribution sector can significantly reduce carbon emissions and improve energy access, contributing to a more resilient and eco-friendly power grid." In line with this, [13] emphasizes that "green energy innovation plays a pivotal role in driving sustainable development by enhancing resource efficiency and reducing the environmental footprint of energy production systems." [14] highlights that "the transition to renewable energy technologies in the energy sector helps mitigate climate change, improve energy security, and reduce dependency on fossil fuels." Additionally, [15] further argues that "sustainable practices and green technologies can provide economic benefits, such as cost reductions in energy production and enhanced operational efficiency in the long term."

[16] adds that "the integration of digital management systems with green energy technologies can optimize resource usage and facilitate real-time monitoring of energy consumption, further enhancing the sustainability of the energy distribution sector." [17] states that "collaborative efforts in green energy initiatives, especially in urban settings, help improve energy efficiency and promote a circular economy, contributing to both environmental and social sustainability." Finally, [18] further reinforces the idea

that "the implementation of green economy-themed programs, particularly those focusing on community engagement, leads to an increase in consumer satisfaction and supports sustainable business practices."

[19] emphasizes that "green energy development and regulatory support are critical to achieving sustainable growth in emerging economies, particularly by reducing carbon emissions and increasing energy access." [20] further highlights that "advancing renewable energy technologies and improving energy efficiency is essential for transforming the global energy landscape and addressing environmental challenges."

[21] emphasizes that "green investments and the promotion of renewable energy sources are key to supporting green economic growth and enhancing ESG (Environmental, Social, Governance) practices, which are critical for both corporate sustainability and societal welfare." [22] further argues that "adopting renewable energy solutions not only contributes to sustainability but also plays a pivotal role in mitigating the negative impacts of climate change, ensuring a balanced approach to development and environmental protection."

Therefore, the application of green economy principles in the energy sector can be understood as a strategic effort to balance operational efficiency, environmental sustainability, and improved customer service quality.

3 Methodology

3.1 Research Approach

This study uses a descriptive quantitative approach to analyze the customer satisfaction index of PLN UP3 in the regions of Sulselrabar. Numerical data was collected through an online survey that measured customer perceptions and satisfaction with PLN UP2D services. Assessments of several customer satisfaction indicators were used to evaluate service quality and the factors that influence it. The analysis was conducted to identify factors contributing to changes in customer satisfaction based on data from respondents with various job levels at UP3.

A descriptive design was used because this study aimed to describe the existing conditions in depth without testing hypotheses or seeking cause-and-effect relationships. The focus was to explore information about customer satisfaction index and identify factors that could improve the quality of PLN UP3 services through the application of Quick win Solutions and Green Economy principles.

3.2 Population and Sample

The population in this research consisted of employees and customers of PLN UP3 spread across the Sulselrabar regions. The research sample was taken using purposive sampling, which is the selection of respondents based on certain criteria relevant to the focus of the research, such as positions related to customer service and technical matters. The sampling will cover various job levels directly related to operational activities and customer service. The sample consisted of managers, team leaders/supervisors, electrical network managers, customer service unit managers, and

staff from 10 UP3s served by PLN UP2D Sulselrabar. There were a total of 116 respondents who completed the survey. In Semester 1 of 2024, there were 92 respondents, and in Semester 2 of 2024, there were 24 respondents who completed the questionnaire.

3.3 Data Collection

Data collection was carried out using two main techniques, namely online surveys and literature studies. Online surveys were conducted using questionnaires sent online to respondents at PLN UP3 and UP2D Sulselrabar. Respondents were asked to rate various aspects of the service on a scale of 1-5 (Not Satisfied to Very Satisfied). The data collected included the respondents' names, positions, employee identification numbers, and customer satisfaction indicators, which assessed, among other things, the speed of response in handling disruptions, the quality of SCADA equipment and distribution systems used, the efficiency of renewable energy use and measures in the green economy, and the implementation of standard operating procedures (SOPs) in disruption management.

In the literature study, to enrich the analysis, a review was conducted of relevant literature on the use of SCADA technology, Quick win solutions, and the application of green economy principles in the energy distribution sector.

3.4 Research Instrument

The main research instrument was a questionnaire consisting of three main sections. Section I covered the respondents' demographic data (name, position, employee ID number, and unit of origin). Section II covered customer satisfaction indicators based on service aspects, which were rated on a scale of 1 to 5 (dissatisfied to be very satisfied). These indicators include response speed in handling disruptions, reliability of the distribution system and disruption recovery, use of environmentally friendly technology and reduction of carbon footprint (green economy), operational efficiency and maintenance of SCADA equipment. Then section III contains questions regarding customer satisfaction measurements of PLN UP2D and UP3 operations in the Sulselrabar regions.

3.5 Data Analysis

The collected data will be analyzed using descriptive analysis to describe the frequency distribution and average customer satisfaction based on the results of the survey conducted in the 1st semester of 2024. The customer satisfaction index obtained from this survey will be used as initial data to map activities that can be developed to improve customer satisfaction.

These identified activities will then be formulated into Quick win Solutions. Quick win Solutions are quick and concrete steps aimed at increasing the customer satisfaction index. It is hoped that after Quick win Solutions are implemented in the 1st semester of

2024, there will be a significant increase in the survey results in the next survey period (2nd semester of 2024).

3.6 Research Procedure

The first stage is planning and preparing research instruments, which includes creating questionnaires and selecting respondents. Once the instruments are ready, data is collected through an online survey that lasts for one week. The results are interpreted by comparing the survey results with the initial data (customer satisfaction index) obtained. Based on the survey findings, activities that need to be developed to improve customer satisfaction will be mapped and formulated in the form of Quick win Solutions.

4 Results

This chapter discusses the results of surveys conducted in the 1st semester of 2024 and the 2nd semester of 2024. Based on the surveys, there are several important points that need to be developed to improve service quality, as reflected in the survey assessment results on a scale of 1–5 in the 1st semester of 2024. These activities that need to be developed are manifested in the form of Quick win Solutions, which are quick solutions designed to improve assessment results on the survey points given. This research aims to identify and evaluate the Quick win Solution activities implemented by PLN UP2D Sulselrabar to improve service quality, with the hope of increasing the customer satisfaction index at PLN UP3. This research analyzes the effect of Quick win Solution on increasing customer satisfaction in Semester 2 2024, with a focus on SCADA technology development and green economy implementation. The purpose of the measurement is to identify the impact of the Quick win Solution activities that have been carried out in increasing the customer satisfaction index at PLN UP3 in the Sulselrabar region, as well as to show a significant increase in the Semester 2 2024 survey.

The survey was conducted in the 1st semester of 2024 to measure the customer satisfaction index with the services provided by PLN UP2D Sulselrabar. The survey involved 92 respondents consisting of various job levels at PLN UP3 across Sulselrabar, including managers, team leaders/supervisors, assistant managers/network managers, customer service unit managers, and staff. Respondents were selected using purposive sampling, which means that only respondents who were directly involved in operational activities and customer service participated in the survey. The survey was conducted with the aim of measuring the customer satisfaction index for the services provided by PLN UP2D. The distribution of respondents based on position is presented in Table 1 as below.

Table 1. Distribution of Respondents in the 1st semester of 2024

No	Position Level	Number

		Of Responden
1	Operations Unit Manager	5
2	Assistant Manager / Electrical Network Manager	10
3	Customer Service Unit Manager	20
4	Team Leader / Supervisor	34
5	Staff	23

Source: Data from the 1st semester Survey by Authors, 2024

This survey focuses on evaluating important aspects of PLN UP2D's services that affect customer satisfaction, such as response speed to disruptions, use of SCADA technology, and the application of green economy principles in electricity distribution management. Ratings are given on a scale of 1-5 (Not Satisfied to Very Satisfied), with respondents asked to rate various survey points that have been prepared. The data collected from 92 respondents will be used as initial data to map activities that can be developed to improve the customer satisfaction index. The survey points and results for the 1st semester of 2024 are presented in Table 2 as below.

Table 2. The survey points and results for the 1st semester of 2024

No	Survey Points	Score (1-5) In 1st Semester of 2024
1	With SCADA equipment, it helps in the operation of the power distribution grid.	4,16
2	UP2D coordinates with UP3 regarding the power outage schedule for maintenance of PMT cubicles / Transformers / 20 kV GI/ GH Busbars.	4,15
3	UP3 employees on duty can easily contact the Dispatcher when a disturbance occurs.	4,10
4	The UP2D HAR team has used PPE and implemented K3 standards properly and correctly.	4,09
5	UP2D coordinates with UP3 regarding the shutdown schedule for the installation/maintenance of motorized REC/LBS.	4,07
6	The dispatcher receives complaints and responds quickly, politely, and appropriately.	4,06
7	The Websurv application (UP2D Single Line Diagram display on UP3) helps monitor network operations.	4,05
8	UP2D coordinates with UP3 regarding the planned installation points for motorized REC/LBS.	4,04
9	UP2D is quick in preparing SOPs for national events and VIP visits.	4,03
10	The dispatcher carries out maneuvers in accordance with SOPs when disruptions occur.	3,93
11	The dispatcher quickly recovers network segments that are not affected.	3,88
12	UP2D conducts surveys of planned SCADA keypoint locations.	3,82

13	UP2D is quick in updating any changes to the 20 KV Single Line Diagram.	3,81
14	UP2D replaces and installs CBOG cubicles when damage is found in the equipment.	3,67
15	UP2D is quick in responding to and handling protection failures (REC/LBS/GH).	3,58
16	UP2D responds quickly and handles remote control failure disruptions.	3,51
	Average Customer Satisfaction Score/Index for PLN UP2D Sulselrabar in the 1st semester of 2024.	**3,95**

Source: Data from the 1st semester Survey by Authors, 2024

The PLN UP2D Sulselrabar Customer Satisfaction Index based on the results of the 1st semester 2024 survey was 3.95 (Fairly Satisfied), with the indicator "The use of SCADA equipment helps with the operation of the distribution grid" receiving the highest score of 4.16. This indicates that respondents highly value the use of SCADA technology in supporting the smooth distribution of electricity and accelerating the handling of disruptions. On the other hand, the indicator with the lowest score is "UP2D is quick to respond to and handle remote control failures," which only scored 3.51. This indicates that there are challenges in the remote-control system that prevent outages from being resolved quickly, and this is an area that needs improvement.

Based on the survey results, improvement measures will be formulated in the form of Quick win Solutions based on the principles of Green Economy. These quick solutions are designed to improve service quality in the period below the survey. To facilitate the formulation of Quick win Solutions, activities that need to be developed, which are directly related to the survey points that have been carried out, are identified and improved. These activities are described in Table 3 below.

Table 3. Activities that Need to be Improved Based on the Survey Results

No	Point Survey	Activities that Need to be Improved
1	With SCADA equipment, it helps with the operation of the power distribution grid.	SCADA integration for keypoints
2	UP2D coordinates with UP3 regarding the power outage schedule for maintenance of PMT cubicles / Transformers / 20 kV GI/ GH Busbars.	Mobile application for real-time outage schedules
3	UP3 employees on duty can easily contact the Dispatcher when a disturbance occurs.	Flexible telecommunications for dispatchers
4	The UP2D HAR team has used PPE and implemented K3 standards properly and correctly.	Safety and security training programs
5	UP2D coordinates with UP3 regarding the shutdown schedule for the installation/maintenance of motorized REC/LBS.	Accelerate information system integration

6	The dispatcher receives complaints and responds quickly, politely, and appropriately.	Improved communication for complaints
7	The Websurv application (UP2D Single Line Diagram display on UP3) helps monitor network operations.	Enhanced Websurv features for user-friendliness
8	UP2D coordinates with UP3 regarding the planned installation points for motorized REC/LBS.	Efficient monitoring application training
9	UP2D is quick in preparing SOPs for national events and VIP visits.	SOP flow improvements
10	The dispatcher carries out maneuvers in accordance with SOPs when disruptions occur.	Outage recovery training
11	The dispatcher quickly recovers network segments that are not affected.	Remote equipment failure improvements
12	UP2D conducts surveys of planned SCADA keypoint locations.	Add SCADA keypoints in strategic locations
13	UP2D is quick in updating any changes to the 20 KV Single Line Diagram.	Automatic monitoring system for setting changes
14	UP2D replaces and installs CBOG cubicles when damage is found in the equipment.	Cubicle stock procurement and technical training
15	UP2D is quick in responding to and handling protection failures (REC/LBS/GH).	Technical training on cubicle maintenance
16	UP2D responds quickly and handles remote control failure disruptions.	Mobile application to facilitate outage reporting

Source: Author's elaboration, 2024.

After identifying the activities that need to be improved based on the survey results, the next step is to formulate Quick win Solutions. These quick solutions aim to provide direct improvements in areas that need improvement, to quickly increase the customer satisfaction index in the next survey period. These Quick win Solutions will focus on solving existing problems in a short period of time, by applying the principles of Green Economy in every step, which includes energy efficiency, carbon footprint reduction, and the use of environmentally friendly technology. With effective implementation, it is hoped that there will be a significant improvement in service quality and customer satisfaction at PLN UP2D Sulselrabar. Table 4 shows Quick win solutions as activity developments.

Table 4. Quick win solutions with green economy principles based on activities that need to be improved and the status of Quick win solution program implementation

No	Activities that Need to be Improved	Quick win Solution with Green Economy Principles	Implemented / Not yet Implemented
1	SCADA integration for keypoints	Addition of SCADA integration points with renewable energy (solar panels) to reduce fossil fuel consumption	Implemented
2	Mobile application for real-time outage schedules	Implementation of environmentally friendly cloud-based data server applications	Implemented
3	Flexible telecommunications for dispatchers	Use of energy-efficient POC/HT Digital	Implemented
4	Safety and security training programs	Training on safety procedures related to green energy management and environmentally friendly technology	Implemented
5	Accelerate information system integration	Implementation of Daily/Weekly Zoom Checkpoints to determine work plan outages	Implemented
6	Improved communication for complaints	Refreshment of Dispatcher SOP	Not yet implemented
7	Enhanced Websurv features for user-friendliness	Use of data centers with renewable energy for hosting Single Line Diagrams of Electricity Grid Interactive Software	Not yet implemented
8	Efficient monitoring application training	Online meeting regarding plans to install power grid protection equipment to reduce carbon emissions (no need to go offline to reduce carbon emissions and increase efficiency)	Implemented
9	SOP flow improvements	WhatsApp Group for VVIP activity SOP	Implemented

10	Outage recovery training	Preparation of SOPs that integrate EBT generators	Not yet implemented
11	Remote equipment failure improvements	Refreshment of Dispatcher SOP	Not yet implemented
12	Add SCADA keypoints in strategic locations	Joint survey with UP3 for SCADA integration points with renewable energy	Implemented
13	Automatic monitoring system for setting changes	Single Line Diagrams of Electricity Grid change reporting website	Implemented
14	Cubicle stock procurement and technical training	Retrofit Cubicle Program (Repair of Old/Damaged Cubicles) and Procurement of Vacuum Cubicles (without SF6 gas)	Implemented
15	Technical training on cubicle maintenance	MACO (Maintenance Control) spreadsheet with cloud server data	Implemented
16	Mobile application to facilitate outage reporting	MACO (Maintenance Control) spreadsheet with cloud server data	Implemented

Source: Author's elaboration, 2024.

Several Quick Win Solution activities based on Green Economy Principles implemented in the 1st semester of 2024 are below:

4.1 Addition of SCADA integration points with renewable energy (solar panels) to reduce energy consumption.

One strategic step to reduce dependence on fossil fuels is to increase SCADA integration points with renewable energy sources, such as solar panels. By supporting the SCADA system, PLN can reduce the carbon footprint generated by fossil fuel power plants and improve the efficiency of distribution grid operations. This is also in line with the principle of a green economy, which is the goal of energy management to achieve long-term sustainability by reducing negative impacts on the environment and ensuring cleaner and more environmentally friendly energy use.

4.2 Software or Spreadsheet with eco-friendly cloud-based server data.

Software that uses eco-friendly cloud-based server data enables more efficient data processing by using renewable energy sources such as wind or solar power to run

servers and systems. The use of cloud computing allows for more efficient data processing, thereby reducing the need for physical infrastructure that has the potential to waste energy. In addition, eco-friendly data centers use energy-efficient cooling technologies that reduce carbon footprints and decrease the amount of energy consumed. This method improves operational sustainability and optimizes the use of resources in an eco-friendly environment, supporting the principle of a green economy. Some applications that have been used with these data servers include the Online Maintenance Control (MACO) Spreadsheet Application for recording SCADA disturbances.

4.3 Online meeting regarding plans to install power grid protection equipment to reduce carbon emissions.

Online meetings regarding plans to install power grid protection equipment for all UP3s are a more efficient solution than offline meetings, as they reduce carbon emissions generated from travel and physical transportation. By using digital platforms, meetings can be conducted efficiently and cost-effectively, while reducing the energy consumption associated with face-to-face meetings. This approach supports the principles of the Green Economy by optimizing the use of technology to improve operational efficiency while reducing negative impacts on the environment, such as reducing carbon footprints and making better use of time and resources.

4.4 Retrofit Cubicle Program (Repair of Old/Damaged Cubicles) and Procurement of Vacuum Cubicles (without SF6 gas).

The Retrofit Cubicle Program, which involves repairing old or damaged cubicles and procuring SF6-free vacuum cubicles, is an important step towards improving the operational sustainability of the power distribution system. The use of SF6-free vacuum cubicles strongly supports the principles of the Green Economy, as SF6 is a greenhouse gas with a very high global warming potential. By switching to vacuum technology that is more conducive to an eco-friendly environment and repairing existing equipment, PLN can reduce its carbon footprint, improve operational safety, and reduce negative impacts on the environment, while maintaining the reliability and efficiency of the power distribution system.

A survey was conducted again in the second semester of 2024 to measure the customer satisfaction index with the services provided by PLN UP2D Sulselrabar after the implementation of Quick Win Solutions. This survey involved 24 respondents consisting of various job levels at PLN UP3 across Sulselrabar. The survey was conducted with the aim of re-measuring the customer satisfaction index for the services provided by PLN UP2D. The distribution of respondents based on job level is presented in Table 5.

Table 5. Distribution of Respondents in the 2nd semester of 2024

No	Position Level	Number of

		Responden
1	Operations Unit Manager	2
2	Assistant Manager / Electrical Network Manager	3
3	Customer Service Unit Manager	6
4	Team Leader / Supervisor	5
5	Staff	8

Source: Data from the 2nd semester Survey by Authors, 2024

This section analyzes the Quick Win Solutions implemented to improve service quality at PLN UP2D Sulselrabar. Table 6 below shows the relationship between Quick Win Solution activities, their implementation status, and the customer satisfaction index recorded in the 1st semester and 2nd semester of 2024. By comparing the survey results for both periods, it can be seen whether the improvement measures that have been implemented have led to an increase in customer satisfaction and overall operational efficiency.

Table 6. Implemented or Not Yet Implemented Quicwin Solution and Their Impact on the Results of the 2nd semester Survey of 2024

No	Quick win Solution with Green Economy Principles	Implemented / Not yet Implemented	Score (1-5) In 1st Semester of 2024	Score (1-5) In 2nd Semester of 2024
1	Addition of SCADA integration points with renewable energy (solar panels) to reduce fossil fuel consumption	Implemented	4,16	4,48
2	Implementation of environmentally friendly cloud-based data server applications	Implemented	4,15	4,39
3	Use of energy-efficient POC/HT Digital	Implemented	4,10	4,39
4	Training on safety procedures related to green energy management and environmentally friendly technology	Implemented	4,09	4,22
5	Implementation of Daily/Weekly Zoom Checkpoints to determine work plan outages	Implemented	4,07	4,35

6	Refreshment of Dispatcher SOP	Not yet implemented	4,06	4,26
7	Use of data centers with renewable energy for hosting Single Line Diagrams of Electricity Grid Interactive Software	Not yet implemented	4,05	4,04
8	Online meeting regarding plans to install power grid protection equipment to reduce carbon emissions (no need to go offline to reduce carbon emissions and increase efficiency)	Implemented	4,04	4,30
9	Whatsapp Group for VVIP activity SOP	Implemented	4,03	4,22
10	Preparation of SOPs that integrate EBT generators	Not yet implemented	3,93	4,30
11	Refreshment of Dispatcher SOP	Not yet implemented	3,88	4,26
12	Joint survey with UP3 for SCADA integration points with renewable energy	Implemented	3,82	4,17
13	Single Line Diagrams of Electricity Grid change reporting website	Implemented	3,81	4,04
14	Retrofit Cubicle Program (Repair of Old/Damaged Cubicles) and Procurement of Vacuum Cubicles (without SF6 gas)	Implemented	3,67	4,22
15	MACO (Maintenance Control) spreadsheet with cloud server data	Implemented	3,58	3,83
16	MACO (Maintenance Control) spreadsheet with cloud server data	Implemented	3,51	3,87

Average Customer Satisfaction Score/Index for PLN UP2D Sulselrabar in 2024	**3,95**	**4,21**

Source: Data from the 2nd semester Survey by Authors, 2024

5 Discussion

The PLN UP2D Sulselrabar Customer Satisfaction Index shows a significant increase from the 1st semester of 2024 to the 2nd semester of 2024. In the 1st semester of 2024, the average customer satisfaction score was 3.95, which is classified as "Fairly Satisfied," reflecting a good level of customer satisfaction, although there are still areas that need improvement. However, after the implementation of various Quick Win Solutions and Green Economy-based improvement measures, in the 2nd semester of 2024, the average customer satisfaction index increased to 4.21, which is on the Satisfied scale. This increase reflects the positive impact of efforts to improve service quality, both in terms of technology and operational efficiency. In line with the findings [12], which show that green energy innovations contribute significantly to environmental sustainability and customer satisfaction, the implementation of renewable energy solutions has enhanced both operational efficiency and customer perceptions of service quality. Moreover, integrating green technologies into service operations not only boosts environmental performance but also aligns with long-term customer expectations for sustainability [14]. Based on the above data, three conditions can be identified, as below.

5.1 Analysis for Quick Win Solutions Implemented with Score Improvement.

There are Quick Win Solutions that have been implemented and show an average score improvement of 0.27 points for each survey from the 1st semester of 2024 to the 2nd semester of 2024. These programs have been successfully implemented, resulting in a positive impact on the quality of service provided by PLN UP2D Sulselrabar. This improvement is reflected in an increase in the customer satisfaction index, which shows that the improvement efforts have met customer expectations. Measures such as technological improvements, training, and better coordination between related units have proven to have a significant impact on improving operational efficiency and customer satisfaction. Research [12] confirms that improvements in energy efficiency and green technologies have a direct impact on customer satisfaction by enhancing the overall customer experience. Additionally, studies [13] demonstrate that integrating digital management systems and renewable energy solutions not only boosts service performance but also strengthens customer loyalty by aligning business practices with sustainability goals.

5.2 Analysis of Quick Win Solutions Not Implemented with Decreased Score.

There are Quick Win Solutions that were not implemented but showed a decrease in score of 0.01 points for 1 survey point from the 1st semester of 2024 to the 2nd semester of 2024. The unimplemented Quick Win Solutions that resulted in a decreased score, namely the use of a data center with renewable energy to host the Single Line Diagrams of Electricity Grid Interactive application, contributed to the decreased score from the 1st semester of 2024 to the 2nd semester of 2024. The failure to implement these solutions had a negative impact on the quality of service experienced by customers, indicating that the implementation of Quick Win Solutions is very important to improve customer satisfaction. The decreased score shows that the planned improvement measures are indeed necessary to address existing problems. However, upon closer inspection, this decline is not particularly significant. This is because there is a similar Quick Win Solution that has already been implemented, namely the implementation of an application with an eco-friendly environment cloud-based data server. Although the use of data centers with renewable energy has not been fully implemented, similar solutions that have been implemented have made a positive contribution to data management and energy efficiency, so the impact of the decreased score is not significant. According to [12], even partial implementation of green technologies and energy-efficient solutions can significantly reduce environmental impact and improve operational performance. Additionally, studies [14] indicate that leveraging eco-friendly cloud infrastructure can achieve similar operational efficiency while mitigating environmental effects, making the transition to full renewable energy data centers a gradual but essential goal.

5.3 Analysis for Quick Win Solutions Not Implemented with Score Improvement.

There are Quick Win Solutions that have not been implemented but show a score improvement of 0.2 points for 1 survey point from the 1st semester of 2024 to the 2nd semester of 2024. These Quick Win Solutions that have not been implemented are Refreshment of SOP for Dispatchers, which aims to remind dispatchers of routine SOPs. Although this program has not been fully implemented, the 0.2 point increase in the 1 point survey from the 1st semester of 2024 to the 2nd semester of 2024 may have been influenced by other implemented Quick Win Solutions, such as the creation of an Single Line Diagrams of Electricity Grid change reporting website, which has become one of the SOPs routinely implemented by dispatchers, which has had a positive impact on operational performance. In addition, changes in internal policies or procedures also played a role in improving coordination between units and enhancing service quality. Although the SOP for Dispatchers Refreshment has not been implemented, other factors such as training and new policies can contribute to increased customer satisfaction. As noted in [12], the implementation of digital tools and improved operational frameworks, even without full execution of all planned solutions, can significantly enhance operational efficiency and customer satisfaction. Moreover, [14] suggests that continuous internal policy changes and employee training have long-term

benefits on service delivery and customer loyalty, further supporting the positive effects observed in this case.

In this case, the Quick Win Solution was not implemented, but the score increased, so the program cannot be considered inappropriate in a direct manner, because as explained in the paragraph above, there are other factors that could have caused this increase in score. Based on the results of the research, Quick Win Solutions are an effective approach to improving the customer satisfaction index, especially through simple but significant improvements. In line with the findings [5], which show that the digitization of services such as PLN Mobile and Contact Center 123 has a positive impact on service quality, especially in terms of responsiveness and transparency. Research [6] also confirms that knowledge sharing and motivation greatly influence employee job satisfaction, which ultimately improves the quality of service received by customers. In addition, the result of the research [7] reveals that green economy-based programs, such as the application of renewable energy and energy efficiency, have a direct impact on increasing customer satisfaction index and the Company's operational sustainability.

Regarding the application of SCADA technology, this research is also in line with [9], which explains that SCADA technology enables remote control, real-time monitoring, and reduction of disruption risks, which ultimately improves the reliability of energy distribution systems and customer satisfaction. The application of green economy principles in the energy sector, as expressed by [10], serves to reduce environmental impact and support long-term sustainability, which in turn enhances the company's image as an energy provider with an eco-friendly environment.

This research has several limitations, including time constraints, as data collection was conducted over a period of only one week. Furthermore, there were limitations in terms of respondents, as the survey only covered respondents who were available and willing to fill out the questionnaire. Finally, there is the issue of subjectivity in assessment, because although a clear scale was used, customer satisfaction assessments can still be influenced by personal perceptions. In the future, this research is expected to be expanded with data collection over a longer period of time, as well as involving more respondents from various segments to obtain more representative results. In addition, further research can deepen the analysis of other factors that can affect customer satisfaction, such as the influence of technological developments and company policies. Studies [12] have shown that a more diverse set of respondents, especially those from different customer segments, can help generate more reliable results in customer satisfaction research. Moreover, [14] highlights that incorporating factors such as technological advancements and their impact on customer service can provide deeper insights into satisfaction levels and guide more effective strategic decisions. Therefore, it is hoped that a more comprehensive customer satisfaction measurement model can be achieved and applied more widely across all PLN units.

6 Conclusion

Based on the findings of research related to the implementation of Quick Win Solutions at PLN UP2D Sulselrabar, it can be concluded that the Quick Win Solutions that have been implemented, such as the integration of SCADA with renewable energy, cloud-based server solutions, and other improvements, have shown a significant increase in the customer satisfaction index, with an increase of 0.27 points between the 1st semester and the 2nd semester of 2024. On the other hand, although Quick Win Solutions such as the use of data centers with renewable energy for hosting interactive Single Line Diagrams of Electricity Grid applications were not implemented, the impact on customer satisfaction was only slight, namely 0.01 points, and could be offset by other similar solutions, such as cloud-based server applications. Furthermore, Quick Win Solutions that have not been implemented, such as the Refreshment SOP for Dispatchers, showed an increase in customer satisfaction of 0.2 points. This increase can be attributed to other Quick Win Solutions that have been implemented, such as the Single Line Diagrams of Electricity Grid reporting website and internal policy changes. Overall, these findings confirm that although not all programs were fully implemented, the solutions that were implemented, along with other internal changes, played a role in improving service quality and customer satisfaction.

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