

Optimization of the potential benefits and options to overcome the challenges of restructuring the power sector.

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Abstract—The need for energy and power is anticipated to increase as the economies and populations of several developing nations in Asia and the Pacific continue to expand. Sri Lanka is likewise preparing to restructure the power industry. To support equitable and environmentally sustainable economic development, it is crucial not only to increase energy accessibility and supply electricity to everyone but also to improve the efficiency and responsiveness of their power sectors. The transition to a reformed power sector has the potential to generate significant benefits, including increased efficiency, reliability, and sustainability. However, this transition also presents a range of challenges, including regulatory hurdles, political resistance, and the need for substantial investment. It is vital to adopt a holistic and strategic strategy that takes into account all of the available options in order to maximize the potential advantages of power sector reform and get over these obstacles. This paper reviews the necessity of the reformation, the method of restructuring the power sector reform, benefits and identifies the key challenges facing this transition and explores the various strategies and options that can be employed to address these challenges. The paper concludes with recommendations for policymakers, regulators, and stakeholders on how to navigate the complexities of power sector reform and ensure that this transition delivers maximum benefits for all.

Keywords—reformation, CEB

I. INTRODUCTION

The power industry in Sri Lanka was handled as a government agency in the early years of the country's independence. In 1969, the government created the Ceylon Electricity Board (CEB), a public utility that operated as a

vertically integrated monopoly and was under the control of the Ministry of Power and Energy. Without any level of competition, the CEB performed all of the tasks associated with electricity generation, transmission, distribution, and retail supply.

With the foundation of a state-owned distribution firm in 1983, CEB had minor restructuring to have two distribution regions as region A and region B in order to implement efficient distribution of electricity and achieve target of electricity for throughout the island. The CEB was internally divided into six independent units in 2000 region wise generation, transmission, four distribution regions and headquarters group. After a change of administration in 2004 a new power bill was eventually written and presented to Parliament in February 2008. [1].

The Electricity Reform Act could not be completely implemented without a Ministerial directive, which was not provided owing to political resistance, therefore the Public Utilities Commission of Sri Lanka (PUCSL) was established in 2009 according to Act No. 20 as the authority over the electricity sector. However, compared to what the 2002 Electricity Reform Act had suggested, less reform of the CEB was permitted. The CEB transmission entity was designated as the sole buyer under the legislation, but the CEB's business segments or divisions were not divided into separate legal organizations. As a result, the CEB possesses six licenses for the electricity industry, including one each for generating, transmission, and distribution, which together serve almost 90% of all power users.[1].

Although CEB restructured several times, the expected goals were not achieved. Therefore, further restructuring process to be undertaken in order to achieve the expected goals such as increasing efficiency and cost savings through the separation of different functions and the introduction of competition in the sector. The best practices for power sector restructuring include creating a supportive legal and regulatory environment, unbundling the power sector into separate sectors, privatizing power distribution utilities and generation assets, implementing open access to transmission and distribution wires, operating the generation and retailing markets competitively, privatizing the transmission network or operating it as a concession, and overseeing prices and incentives for transmission and distribution operations by an independent regulator. This paper discussed options to overcome the challenges of privatizing power distribution utilities and generation assets with the optimization of potential benefits.

II. NECESSITY OF REFORMATION

As the mission of the CEB is “To develop and maintain an efficient, coordinated and economical system of electricity supply to the whole of Sri Lanka while adhering to our core values, quality, service to the nation, efficiency and effectiveness, safety, professionalism, sustainability, commitment” CEB should get the responsibility for that [2]. Since Sri Lanka faced an economic crisis the CEB also tended to face losses as a company. The Ceylon Electricity Board (CEB) should restructure to improve the efficiency and effectiveness of the power sector in Sri Lanka. Dividing the CEB into separate entities for generation, transmission, and distribution can lead to increased competition, private sector participation, and investment in the power sector. This can lead to improved reliability and quality of electricity supply,

lower costs and better access to electricity for consumers. Additionally, restructuring can enable the implementation of policies and regulations to promote sustainable and environmentally friendly power generation. Together with increasing energy availability and ensuring that everyone has access to electricity, these nations must strengthen and improve the responsiveness of their power industries to promote more inclusive and environmentally sustainable economic growth.

Although the restructuring method addresses some issues nowadays it is necessary to reform the CEB management system again for the below reasons.

A. Increment of the overhead cost

The size of the workforce in CEB can be viewed as both an advantage and a challenge. On the one hand, the large number of employees means that the organization has a wealth of human resources and expertise at its disposal. On the other hand, it can also lead to inefficiencies and bloated administrative structures [3].

As part of the reform process, it may be necessary to review the size and structure of the workforce to ensure that it is aligned with the organization's goals and objectives. CEB is having a heavy top in the management structure. This could involve downsizing in some areas while investing in training and development programs to enhance the skills of remaining employees. It may also involve introducing more flexible working arrangements or performance-based incentives to improve productivity and efficiency.

Ultimately, the goal should be to create a lean and agile organization that is capable of delivering high-quality services to its customers while remaining financially sustainable. Achieving this will require a careful balance between reducing costs, improving efficiency, and retaining a skilled and motivated workforce.

B. Financial management is not included

The CEB's financial records and practices have been criticized for being opaque and lacking transparency, which has led to financial losses and inefficiencies [1]. The absence of a clear and transparent financial governance framework, cost reduction measures, and efficient revenue collection processes has further exacerbated the problem.

Without proper financial management, the CEB is unable to manage its debt, allocate resources efficiently, or make sound investment decisions. This not only affects the CEB's financial performance but also has a negative impact on the country's economy as a whole. The lack of financial management also affects the CEB's ability to attract private investment, which is necessary for the development of the power sector.

Therefore, it is essential to introduce financial management as a core component of the reformation process. By establishing a clear and transparent financial governance framework, implementing cost reduction measures, improving revenue collection processes, and developing a robust investment planning process, the CEB can optimize its financial performance and achieve financial sustainability.

C. Serious reform attempts and efforts to address identified deficiencies, gaps, and fragmentation

To solve the supposed imperfections inadequacies, and fragmentation in the electricity industry, particularly the Ceylon Electricity Board (CEB), serious reform efforts and initiatives are required. The current system is not suitable for addressing the challenges and complexities of the rapidly evolving energy landscape. The need for a reformation is urgent as the CEB is struggling with issues such as high levels of debt, inefficient operations, high losses, and outdated infrastructure.

A comprehensive reformation of the CEB can address these issues by introducing modern, market-oriented practices and enhancing financial management, operational efficiency, and investment planning. The current method of balancing technical and financial aspects of the CEB's operations may not be effective, as the focus on technical aspects may have led to financial mismanagement and inefficiencies.

Therefore, there is a need for a holistic approach to reformation that considers both technical and financial aspects in a balanced manner. The reformation should prioritize financial sustainability and ensure that the CEB operates in a transparent and efficient manner, while also investing in modernizing the technical infrastructure to keep pace with the evolving energy landscape.

Ultimately, the reformation is necessary to ensure that the CEB can provide reliable, affordable, and sustainable electricity to meet the growing demand of Sri Lanka's economy and society.

D. The institutions in place for sustainable development are insufficient and disconnected.

It is critical to reform Sri Lanka's electricity industry, especially CEB, as the country's current institutions for sustainable development are underdeveloped and disconnected. Inadequate policies and regulations, lack of transparency, and insufficient technical and financial capabilities have hindered the sector's growth and development. Moreover, Sri Lanka's power sector faces numerous challenges, such as meeting the increasing demand for electricity, ensuring energy security, reducing carbon emissions, and improving access to electricity in rural areas.

To overcome these challenges, it is necessary to reform the power sector and strengthen sustainable development institutions. This can be achieved through the introduction of new policies and regulations that prioritize sustainable development, promoting transparency and accountability, and increasing investments in technical and financial capabilities. The reformation will enable the sector to adopt innovative and sustainable technologies, improve operational efficiency, reduce waste, optimize the use of existing resources, and implement cost-saving measures.

In order to lower the cost of electricity production and lessen reliance on imported fossil fuels, the reformation can also promote the expansion of the usage of renewable energy sources, such as wind and solar power. Promoting energy efficiency and conservation can also assist lower the demand

for electricity and, as a result, cut the price of producing electricity.

III. ANTICIPATED RESTRUCTURING METHOD

The Ceylon Electricity Board is being restructured, and the government is contemplating a number of possibilities, including selling stock in more than 18 institutions, creating public-private partnerships (PPP), and converting them into private limited corporations [4].

According to that reformation, LECO is anticipated to maintain its current corporate position. The Mahaweli and Laxapana hydropower complexes, Samanalawewa and other hydropower units, the Norochcholai coal power plant, the CEB-owned oil-fired thermal plants Kelanithissa and Sapugaskanda, and the Mannar wind power station will be operated as individual entity.

Two organizations are recommended: one to serve as the custodian trustee and to oversee the management of the CEB provident fund and the CEB pension fund for employees who elect to transfer to these new businesses, and another to assume any remaining duties and responsibilities.

IV. OPTIMAZATION OF BENEFITS OF THE POWER SECTOR REFORMATION

With the ability to supply households, businesses, and industries with energy, the power sector is a vital part of every economy. A healthy power industry can promote economic expansion, increase social welfare, and increase environmental sustainability. However, there are other issues that affect the power sector globally, including outdated infrastructure, ineffective operations, poor financial management, and limited access to cutting-edge technologies. As a result, the necessity for reform in the power industry is becoming increasingly apparent. With reference to the CEB in Sri Lanka, this study tries to highlight the advantages of reforming the power sector in this setting [1].

A. *The individual unit can be a profitable*

After the CEB reform, individual units can benefit from increased competition and a more efficient electricity market. Here are some ways to optimize the benefits for individual units:

1) *Cost savings:*

The introduction of competition can lead to lower prices and increased cost savings for individual units. These cost savings can be reinvested in the business, leading to increased profitability.

2) *Energy efficiency:*

The CEB reform can lead to more focus on energy efficiency and conservation, which can reduce energy consumption and hence costs for individual units.

3) *Renewable energy:*

The adoption of renewable energy can also help individual units to reduce their reliance on expensive fossil fuels and minimize energy costs.

4) *Customized tariff structures:*

The CEB can introduce customized tariff structures for different customer segments, based on their energy usage patterns and needs. This can help individual units to better

manage their energy costs. Currently Sri Lanka is having that customized tariff structure and that system should be improved [1].

5) *Improved reliability:*

The CEB reform can also lead to improvements in the reliability of electricity supply, which can help individual units to reduce their production downtime and improve operational efficiency.

B. *Effectiveness and efficiency are increasing*

To increase its productivity and efficiency, the CEB needs to adopt specific actions. First of all, it needs to establish objectives that are precise and measurable and frequently track and assess progress. Second, it should incorporate cutting-edge technologies and management strategies that have been used successfully by utilities and other organizations. Thirdly, a company can enhance its employees' skills and capabilities by investing in human resources by giving them regular opportunities for training and development. Fourthly, putting in place performance management tools can aid in monitoring and assessing performance and offering feedback for ongoing development. Last but not least, encouraging staff members to seek out and put into practice fresh concepts and solutions can enhance the CEB's general effectiveness and efficiency.

C. *Overhead cost is decreasing*

Conduct a thorough analysis of the existing overhead costs and identify areas where costs can be reduced, such as reducing administrative expenses, streamlining operations, and implementing cost-effective measures. Implement a cost reduction strategy that includes measures to reduce overhead costs while maintaining operational efficiency and effectiveness. This could include reducing staff, outsourcing non-core activities, and consolidating operations.

Monitor and evaluate the effectiveness of the cost reduction strategy regularly to ensure that overhead costs remain under control. Implement an energy management system (EMS) to monitor, analyze, and optimize energy usage across operations, which can help reduce overhead costs associated with energy consumption. Utilize technology to automate processes and reduce overhead costs associated with manual processes, such as paper-based systems and manual data entry.

D. *Customer satisfaction is increasing*

CEB reformation can lead to improved reliability of electricity supply by investing in the power grid and implementing smart grid technology. Additionally, it can enhance customer satisfaction by improving customer service and introducing fair and transparent billing systems. Promoting energy efficiency and conservation measures can also help customers reduce their energy bills and improve satisfaction and loyalty.

E. *Can achieve Vision and mission*

The objective of the CEB is to "develop and maintain an efficient, coordinated, and economical system of electricity supply to the entire country of Sri Lanka while adhering to our core values: Quality, Service to the Nation, Efficiency and Effectiveness." The vision of the CEB is to "Enrich Life through Power." The CEB may more effectively carry out its

mission and realize its goal by implementing reformation initiatives like increasing efficiency, supporting renewable energy, and investing in a smart grid [2].

V. OPTIIONS TO OVERCOME CHALLENGES OF POWER SECTOR REFORMATION

After the power sector reformation, there may still be some challenges that need to be overcome. It is important to continuously monitor and evaluate the system to ensure that it is functioning efficiently and effectively. This includes keeping in touch with customers to address any concerns or complaints, as well as implementing new and innovative methods to improve the system. By taking these steps, the power sector can continue to provide an uninterrupted power supply and meet the needs of customers.

A. *The system should be monitored during the restructuring process*

Monitoring the system during the restructuring process is crucial to ensure the success of the reformation. This helps to identify any potential issues or challenges that may arise and take appropriate actions to address them. This analysis system is important to regularly assess the progress of the restructuring and make any necessary adjustments to ensure that the goals of the reformation are met [1]. By continuously monitoring the system, it becomes easier to identify areas that require improvement and implement appropriate solutions. This helps to mitigate the risks of failure and ensure that the reformation is a success, resulting in a more efficient and effective power sector. Having a regulator to monitor and regulate the power sector can help ensure that the industry operates in a fair, efficient, and transparent manner. This can help to prevent issues such as market manipulation and monopoly behavior.

B. *Highly technical qualified people should be on the director board of CEB*

Having professionally qualified people on the board is crucial for the success of any organization, including the CEB. In the case of CEB reformation, it is essential to have highly technical and qualified people on the board to make informed decisions and provide valuable insights. These experts can help to develop strategies and policies that can address the challenges faced by the organization and promote its growth. By having a technical soundboard, the CEB can effectively manage the technical and financial aspects of the power sector, leading to increased efficiency, better customer service, and improved reliability.

C. *Political interference should be minimized*

Political interference can often hinder the progress of a reformation process. It can result in decisions being made for political gain rather than for the betterment of the system or the customers. Therefore, it is important to keep political interference to a minimum during the reformation process of the power sector. This will ensure that decisions are made based on technical and financial expertise rather than political motivations. It will also lead to a more efficient and effective power sector that can provide better services to customers.

VI. CONCLUSION

In conclusion, the CEB restructured several times with the objective of improving efficiency and providing uninterrupted power supply to customers. Innovative methods can be implemented to achieve these goals, but it is crucial to continuously monitor and make necessary amendments to the system. Additionally, it is important to ensure that companies involved in the restructuring follow the correct procedures to avoid any system failure. Ultimately, the success of the CEB restructuring lies in its ability to provide customers with a better supply of electricity with affordable price.

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