

ELECTROKIT: POWER UTILITY TOOLKIT

Best practices in electric power distribution
companies in the Latin America
and Caribbean region

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ELECTROKIT



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Abstract

The Electrokit is an initiative created by the IDB to strengthen transformation and continuous improvement of electric utilities in the LAC region. It follows international standards that characterize and evaluate utilities based on indicators and best practices. The Electrokit is organized in 16 activities that are common to most electricity utilities. The aim of the toolkit is to provide power utilities, policy and decision-makers access to best practices, current trends, and expertise to: (i) identify challenges, develop a strategy and action plan for addressing them; and (ii) support utilities to be more sustainable, efficient, improve customer experience and accelerate innovation to stay ahead of the rapidly sector transformation. The Overview presents the main objectives of the toolkit, the structure of its areas and activities, and a guide on how companies could design an action plan.

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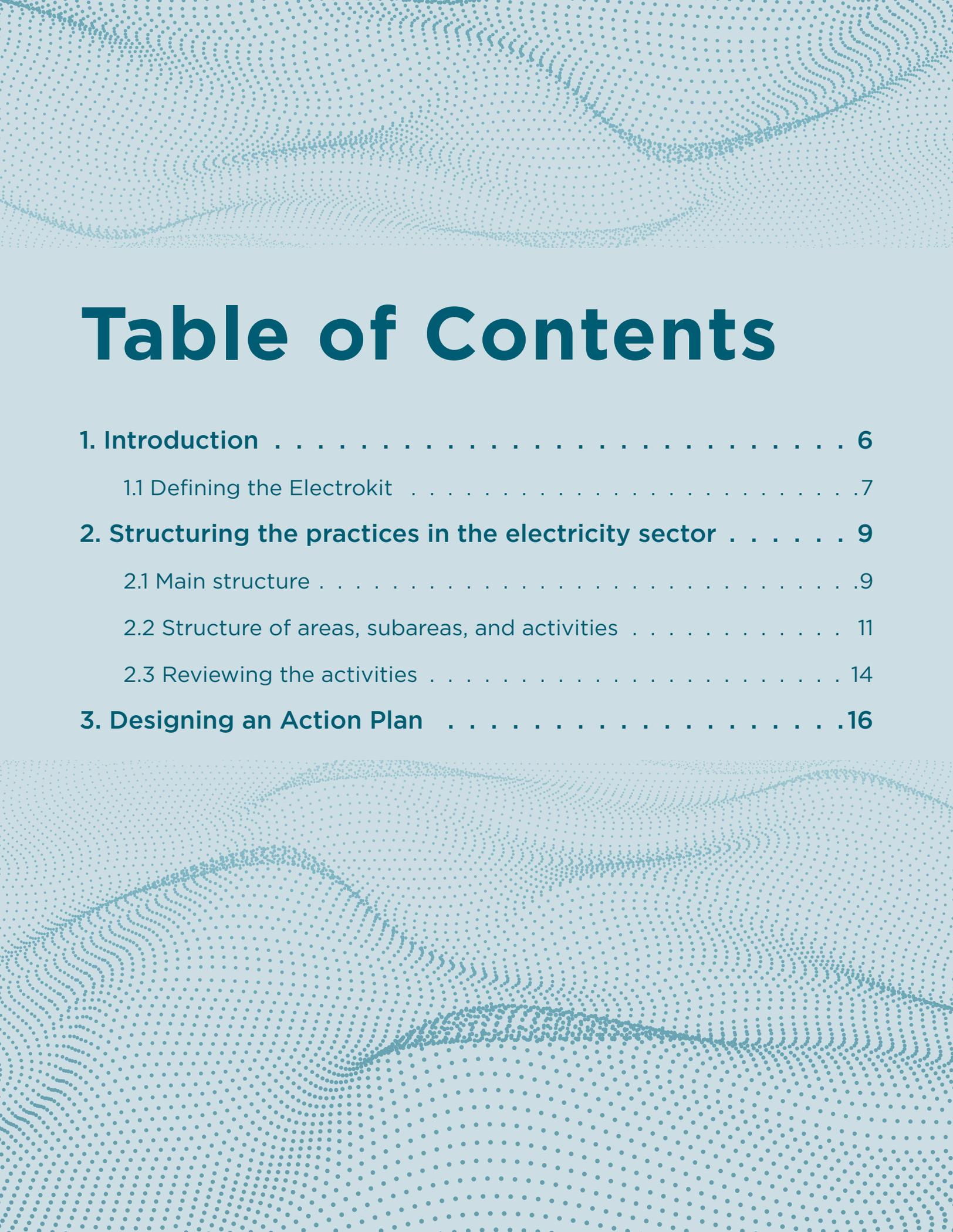


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Acronyms

DG	Distributed Generation
HR	Human Resources
IDB	Inter-American Development Bank
ISO	International Organization for Standardization
LAC	Latin America and the Caribbean
R&D	Research and Development
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SDG	Sustainable Development Goals
SOE	State-Owned Enterprise

1. Introduction

Companies providing electricity services face the need to continuously improve the quality of its services to society, ensure and broaden its coverage, maximize the impact of its investments, and operate in an efficient manner. Distribution companies have also the need to adapt to the new demands from consumers, who are gradually having a more active role. **These are some of the main characteristics of the license to operate utilities have in their geographic coverage. In addition, state-owned enterprises (SOE) in the electricity sector have the added challenges of:** (i) serving policy objectives which are specific to each country and in some cases, (ii) having limited capacity to invest considering their financial constraints.

To achieve these multiple - and sometimes conflicting objectives - utility companies must have robust business models to provide services with quality; and internal learning schemes to strengthen their technical and human capabilities to improve their operational performance. In addition, utilities must have planning and management models aimed at developing and implementing successful transformation processes, assuring the viability of its investments and services.

The Electrokit: Power Utilities Toolkit was developed to support electricity companies in the Latin America and Caribbean region (LAC) identify opportunities to improve their performance, considering the important participation of SOEs in the LAC region¹. This development takes into consideration the extensive experience of the Bank

working with utilities in multiple countries² and international standards in the industry such as International Organization for Standardization (ISO).

The methodology integrally evaluates the utilities, from the quantitative aspects of their performance to the qualitative elements of their processes, practices and technologies used in the management cycle. On the quantitative aspects, the toolkit brings several performance indicators for each activity which can be used as a reference to assess the utility's performance. The toolkit is universally applicable to any type and size of company worldwide, including SOEs. The document also acknowledges the different levels of maturity and sophistication of electricity utilities in the LAC region, and it has been developed to provide this guidance to utilities improve their performance.

The Electrokit however is not a certification tool or an audit instrument; **it is a practical managerial and technical guide to identify improvement opportunities in priority activities, which will be specific to each utility and country setting.** Moreover, the best practices do not detail the extent of applicability to a certain enterprise according to its level of maturity, scale, regulatory framework and market context as these will be tailored to each case. These improvement opportunities are usually developed in a program of activities with targets and the IDB can make available to utilities a team to help elaboration of these activities and monitor them over time.

¹ Government-owned utilities represent the single largest distribution companies, representing 39% of the distribution companies in the LAC region. Source: Fitch ratings https://your.fitch.group/rs/732-CKH-767/images/Fitch_10086090.pdf?mkt_tok=eyJpLjojTXpsaFl6QTBNMlExWIRJMCIsInQiOiJwVHBVZjVncDZ0T29zcfZTMOJadVlcLlVjaWN1dDM2bnJHR3phU1JJSkpkVU5qNlE5OXB-6MXgxSmE4ejRzcjJlVHh1ZWJlZm92amtFYW81UUZObmc9PSJ9.

² For example, the Bank has developed the Aquarating toolkit (<https://aquarating.org/en/>) to improve the performance of water and sanitation companies, and the lessons learned from this development were included in this document.



1.1 Defining the Electrokit

What is it?

The Electrokit is an initiative created by the Inter-American Development Bank (IDB) to strengthen transformation and continuous improvement of electric utilities. The toolkit follows international standards that characterize and evaluate utilities based on indicators and best practices. These practices are grouped in 4 areas and 16 activities that are common to most electricity utility.

The aim of the Electrokit is to provide LAC power utilities, policy and decision-makers access to best practices, current trends and expertise to: (i) identify challenges, develop a strategy and action plan for addressing them; and (ii) support utilities to be more sustainable, efficient, improve customer experience and accelerate innovation to allow the utilities to stay ahead of the rapidly sector transformation.

Companies providing electricity distribution services face the daily challenge of continuously improving services, and in this scenario, companies must seek management models aimed at continuous learning and implementing performance improvement processes. One way to achieve these objectives is to always seek the best practices in the sector.

In general, the challenges for public electricity distribution companies are to ensure:

- i.** the continuity and reliability of electricity service.
- ii.** the affordability of the service.
- iii.** the efficiency in the provision of service.
- iv.** the required transformation to embrace existing and new demands such as distributed generation and electromobility; and
- v.** the sustainability of the utility and the sector.

In addition to these, SOEs have the additional challenges due to their mix of social, economic, political, and strategic interests.

These challenges when properly managed, can be transformed into opportunities for the LAC region, such as: (i) positive impacts on the competitiveness of countries from the improvement of the quality and reliability of services; (ii) reduce inequality by improving the affordability of service, in particular to the most vulnerable populations; (iii) better use of society's limited resources by strengthening the efficiency in provision of service and the financial sustainability of the companies through the reduction of electricity losses; (iv) anticipate new trends to ensure they are better prepared for disruptions in the sector, incorporating new technologies, services, and business models; and (v) ensure the electricity sector is sound and has the proper resources to provide service of quality and meet investment needs.

A recent IDB book has highlighted the trend that the infrastructure sector (and thus power utilities) in LAC are moving from structures to services³, focusing not only on the investments in hard assets, but also simultaneously on the improvement of efficiencies and new services. In this scenario, utilities will need to alter their business models to adjust themselves: for example, declines in the cost of both solar electricity at small scale (and for some industries, wind) and storage have helped decentralize production and bring added competition to the provision of electricity. While the book identified 4 possible scenarios for the future of electricity, the utilities will need to have efficient operations and be financially sustainable with expertise and resource accumulated to adapt to the new market situation.

The Electrokit focuses on the distribution activities of electricity utilities. Based on the Bank's experience in the LAC region, the distribution and commercialization activities have important areas for improvement as they are the ones mostly impacted by technology disruptions and the growing role consumers have in the energy sector.

The Electrokit builds on the opportunities identified in the Energy Sector Framework (ESF)⁴ to improve performance of public utilities following the unbundling of the electricity sector in LAC that

happened in the period 1980-2000s which increased competition along the value chain. This new competitive environment has led public utilities to develop plans to strengthen their corporate governance structure as well as seek ways to improve their operational efficiencies. Moreover, the ESF has identified the need to modernize the public sector incorporating new technologies, and promoting the adoption of innovation, and not only to smooth potential disruption these innovations could bring, but also to incorporate these into their operations.

The benefits of electricity distribution companies using this toolkit are: (i) have access to a comprehensive framework that consolidates the most important processes of a distribution company; (ii) review the company's practices and performance against a set of industry best practices and benchmarks; (iii) advance the analysis with the use of case studies and how other utilities are actually improving their performance and (iv) develop implementation plans with items that have the largest impact on the quality of their services and on their financial sustainability.

The next chapter presents the structure of the Electrokit with a standard approach to review the indicators and practices of each activity.

³ IDB From Structure to Services – The Path To Better Infrastructure in Latin America and the Caribbean (2020). Edited by Eduardo Carvalho, Andrew Powel, Tomás Serebrisky. Accessible at: <https://flagships.iadb.org/en/DIA2020/from-structures-to-services>.

⁴ IDB Energy Sector Framework Document – Energy Division (October 2018). Accessible at: <https://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-715548541-11>.

2. Structuring the practices in the electricity sector

2.1 Main structure

In the context of the use of the Electrokit, the main activities of a typical electricity utility have been organized in four areas. Individual areas are broken down into sub-areas, which are further broken down into activities. [Figure 1](#) illustrates this hierarchy. This organization is based on reviewing similar instruments and the four areas is an attempt to aggregate the activities and processes of the distribution of electricity services in a consolidated and clear manner to facilitate the analysis and implementation of the toolkit's activities.

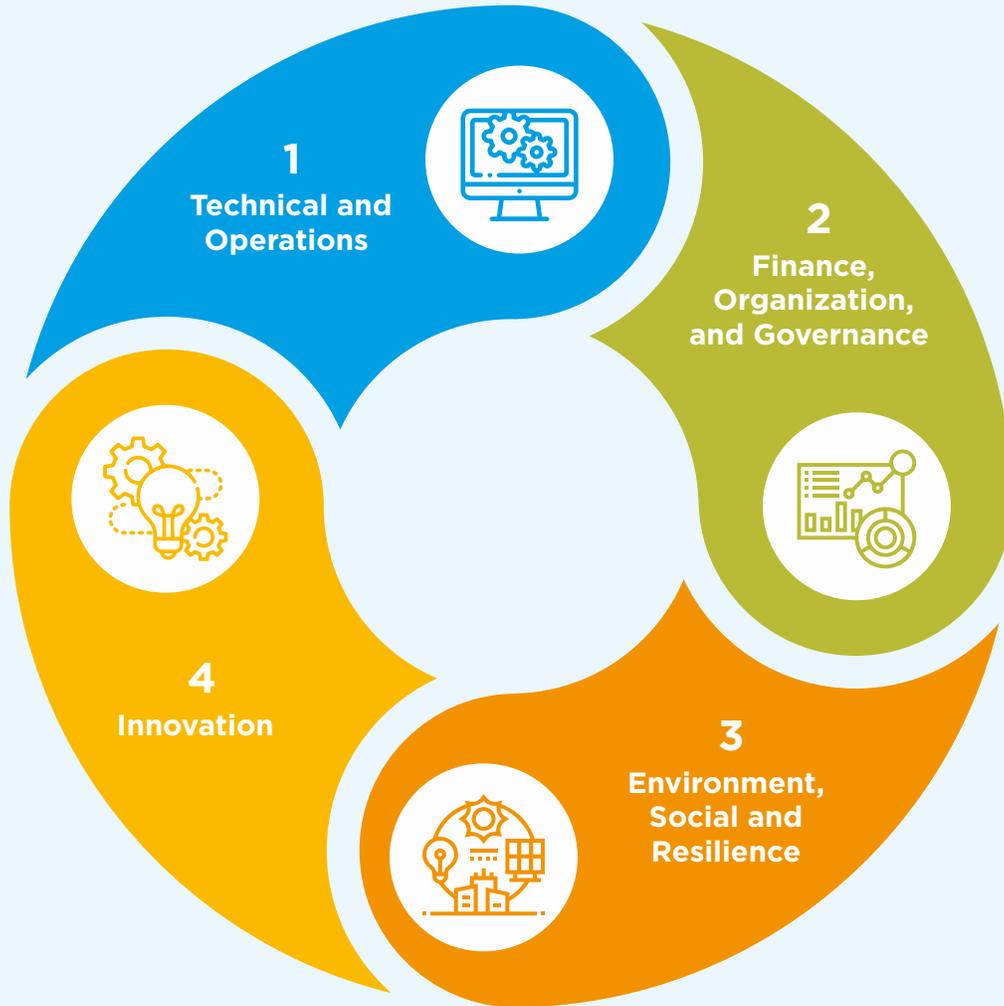
The first area encompasses the technical and operational activities such as the provision, quality, and reliability of the electricity services, including the level of access and the efficiency in the provision of services. These are mostly related to customer service activities and this area is considered part of the core activities of a utility. **The second area** is related to the financial, organizational, and

corporate governance activities which have dedicated literature and practices for their activities but are not very different from other regulated activities. A similar structure is used for **the third area** of environmental, social and resilience activities of an electricity utility. Finally, **the fourth area** of innovation deals with the activities that utilities need to prepare themselves to manage disruptions, technology changes, and development of new business models. In the case of SOEs, advancement in this last area will be dependent on the availability of financial resources as some of them face financial restrictions. Each of these areas is broken-down in subareas and activities and they are further described next.

While the analyses of the toolkit focus on the current situation of the utility, when analyzing the performance indicators, it is important to consider the previous 3 to 5 years (depending on the subarea) as time horizon of the analysis to identify trends and avoid analysis of outliers.

FIGURE 1

FOUR MAIN AREAS



2.2 Structure of areas, subareas, and activities

FIGURE 2

AREAS, SUBAREAS, AND ACTIVITIES

Areas	Subareas	Activities
 <p>1 Technical and Operations</p>	Efficiency in Operation (EO)	<ul style="list-style-type: none"> • Electricity loss reduction • Management of O&M costs
	Quality to Service (CS)	<ul style="list-style-type: none"> • Quality of the Technical Service • Attention to the client
	Access (AS)	<ul style="list-style-type: none"> • Access to service
	Efficiency in Investments (EI)	<ul style="list-style-type: none"> • Efficiency and execution of the investment plan and asset management
 <p>2 Finance, Organization, and Corporate Governance</p>	Financial Sustainability (SF)	<ul style="list-style-type: none"> • Financial management and sustainability • Commercial management
	Corporate Governance (GC)	<ul style="list-style-type: none"> • Autonomy, decision making, controls, and transparency • Strategic planning, organizational structure and Human Resources (HR)
 <p>3 ESR</p>	Environmental, Social and Resilience (ES)	<ul style="list-style-type: none"> • Climate change mitigation • Environmental and social aspects • Resilience and emergency planning
 <p>4 Innovation</p>	Innovation and Vision of the Future (IN)	<ul style="list-style-type: none"> • Technology, digitalization and cybersecurity • Modernization and vision of the future • Innovation Initiatives

This structure of areas and activities will be presented in the web platform using the following visual representation:

Power utility toolkit

The toolkit is an initiative created by the Inter-American Development Bank to strengthen transformation and continuous improvement of electricity distribution companies. The toolkit is based on international available benchmarks and best practices. These practices are grouped in 4 areas and 16 activities that are common to most electricity utility.



The first area related to the technical and operational activities includes the core actions of a distribution company and it is subdivided into six main activities:

- 1. Electricity Loss Reduction** - Assesses the degree of productivity and efficiency of the transmission and distribution systems of the utility. It analyzes indicators and benchmarks and introduces best practices when designing a comprehensive plan to improve the technical and non-technical (commercial) electricity losses.
- 2. Management of O&M costs** - Reviews the operation and maintenance (O&M) costs of the utility to assess its efficiency and optimal costs of operation with a focus on the transmission and distribution. The analysis and benchmarking of this activity can be relevant to the determination of the
- 3. Quality of the Technical Service** - Measures the reliability, continuity of supply, and the voltage quality of the electric system using a set of standard metrics. Overall, it relates to the ability of the electric system to perform its functions, measuring indicators such as SAIDI (System Average Interruption Index) and SAIFI (System Average Interruption Index).
- 4. Attention to the client** - Assesses the interaction between the service provider (distribution company) and the user on services such as responsiveness to customers, billing information, service disruptions, and handling complains. Main objective is to

provide best and most responsive service to the customers.

5. **Access to service** – Describes how the utility is supporting national electricity plans to achieve universal electricity coverage, which includes access to remote locations usually in rural areas, as well as those in urban areas with limited access to electricity. It also includes analysis of affordability of the electricity service to less vulnerable parts of society.
6. **Efficiency and execution of the investment plan and asset management** – Reviews the utility’s methodology and process of its investment (financial and operational) plans and the prioritization of projects. Also includes the activities of maintenance of existing assets and the mechanisms the utility have to deal with unforeseen events and shocks.

The second area relates to the financial aspects, organization considerations, and the corporate governance of the utilities. It is organized into 2 subareas and 4 main activities:

7. **Financial management and sustainability** – This activity analyzes the financial health and sustainability of the utility and to what extent its revenues cover the costs and obligations using ratios and benchmarks references. It also includes assessment of the balance sheet (e.g., asset register, short-and long-term debt) and remuneration to the capital.
8. **Commercial management** – Assesses the sales and commercial management practices and processes of an electricity utility in activities such as billing and invoicing, collection, and debt management. Also includes management of customer register and internal controls to customer databases. This is an evolving area as with the diffusion of distributed generation (DG), customers are gradually becoming producers in some countries.

9. **Autonomy, decision making, controls, and transparency** – Reviews the main activities of corporate governance of a utility in areas such as accountability, autonomy and transparency, disclosure of information, enterprise risk management, and internal control. Reviews the roles and responsibilities among the Board of Directors, Management, and the other stakeholders.

10. **Strategic planning, organizational structure, and human resources (HR)** – Assesses that a performance management is in place to monitor the utility’s performance in the short and long term, the adequateness of its internal organizational structure and hierarchy, and the aspects of people management. Also reviews and introduces the best practices on the topics related to gender equality, diversity, and inclusion.

The third area deals with the environmental, social, and safeguard (ESR) activities of a utility. It also includes the aspects of resilience and emergency preparedness, and how it is mitigating and adapting to climate change. It is subdivided into three main activities:

11. **Climate change mitigation** – Reviews activities that distribution companies have introduced to mitigate climate change and reduce emissions, with a focus on energy efficiency measures and standards. Also reviews their commitments and activities towards distributed generation (DG) with renewable energy and electromobility.
12. **Environmental and social aspects and safeguards** – Reviews the environmental and social policies, standards, and operational practices of the utility, and their adherence to local and national legislation and international best practices. Reviews also utility’s contribution to the Sustainable Development Goals (SDG).
13. **Resilience and emergency planning** – Assesses the preparedness of the utility systems and infrastructure against natural disasters and its contingency plans. Refers to the capacity of the energy systems to cope with the hazardous and external shocks and maintain its essential function.

Lastly, the fourth area of innovation presents how utilities can transform and modernize themselves, and it is organized in three activities:

- 14. **Technology, digitalization, and cybersecurity** – Reviews the initiatives utilities are undertaking to introduce new technologies and increase digitalization of its network and infrastructure to perform new or innovative services while improving efficiencies and reducing costs (e.g., artificial intelligence, predictive analytics, blockchain). Also includes information technology and cybersecurity activities and controls to mitigate its exposure to risks.
- 15. **Modernization and vision of the future** – Reviews how the utilities are modernizing their activities and considering new business models focused on services to meet future needs of customers, new services and technology disruptions. Also includes the activities of electromobility.
- 16. **Innovation initiatives** – Considers the level of readiness of innovation culture in the utility, including a review of the internal processes, its ambition and behavior, and resources dedicated to innovation, which can be to optimize existing customers or broader to develop breakthroughs). Also includes the partnerships (and the results) the utility has established with leading external organizations to foster innovation.

- » Indicators provides access to trends, key metrics, and data for the activity. This is the quantitative part of the analysis using external data,
- » Self-Assessment presents a qualitative assessment of the level of maturity of the utility based on a simple set of questions, with an indicative way to elaborate an action plan,
- » Simulation presents the functionality for the users to enter their own data and compare their performance with other utilities (available in the web version),
- » Best-Practices presents the best practices for the activity, including insights that are used as a guide for how other companies are managing this activity and how they have benefited from the introduction of the best practices.
- » Case Studies lists case studies, methodologies, and technical references in annexes.

The two other modules are: initial **Planning** activities which include the preparatory tasks to be discussed between the IDB team and the utility before initiating the utilization of the Electrokit. Data gathering is also part of the planning activities; and the final **Implementation** activities which follow the analysis and action plan and are to be introduced in discussion with the utility. This final stage defines how the projects identified will be implemented, including the governance, the source of funds, and executing arrangements.

The Electrokit is therefore a tool which can be reviewed independently by the utility or in cooperation with the IDB team who can help: (i) identify the opportunities for improvement; (ii) development of an action plan, and (iii) help monitor implementation over time.

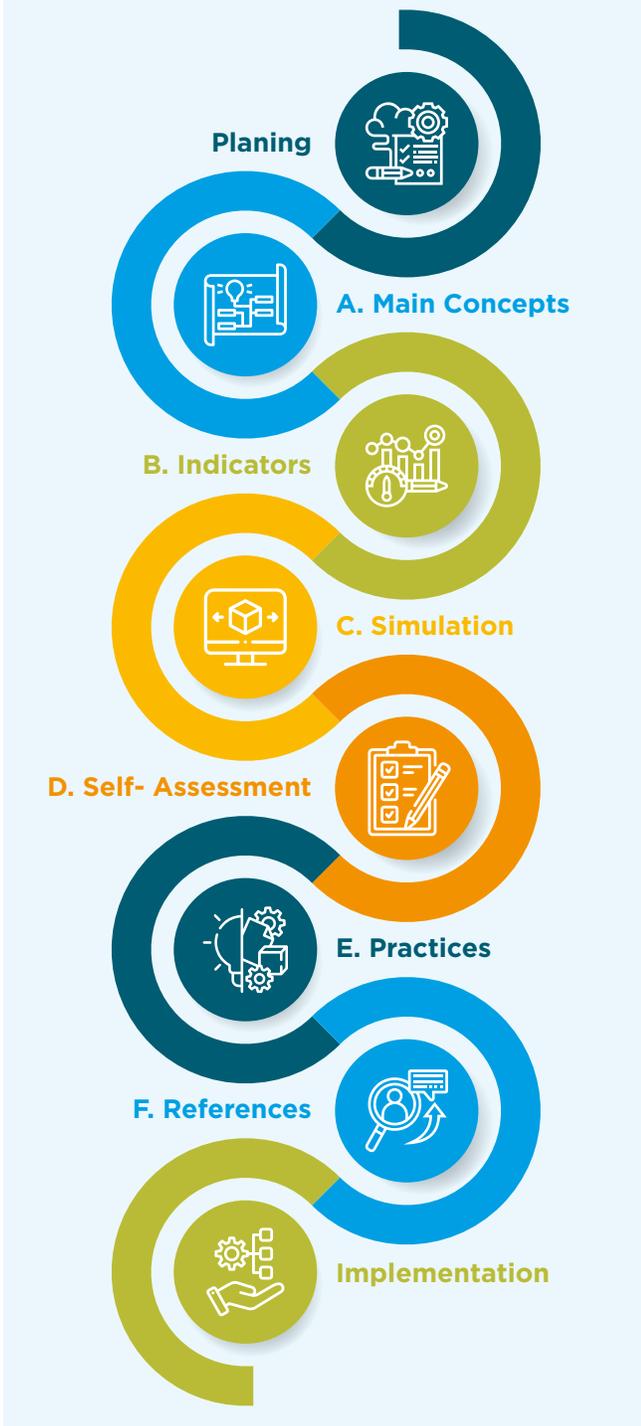
2.3 Reviewing the activities

This document Electrokit: Power Utility Toolkit – The Overview presents the structure of the initiative, which will also be available in a web-enabled and digital interactive format. For each activity, the Electrokit will have the following modules ordered as:

- » Overview or Main Concepts which presents a brief description of the activity,

FIGURE 3

**ELECTROKIT
STRUCTURE**



3. Designing an Action Plan



The development of an action plan is an important result from the review of the indicators and best practices for the utility. As an additional functionality of the Electrokit this chapter presents the main tasks to support the identification and prioritization of what are the most relevant practices specific to the utility and what are the best ways to develop and implement an action plan.

The definition of a comprehensive and well thought action plan is essential to attract investment opportunities and communicate the expected results. While there are different methodologies to design an action plan, most of them converge to similar activities, which are presented next as the steps in developing the plan.

STEP 1

Define problem and analyze data

Action plans usually start by clearly defining the main problem facing the utility and political willingness to address it. This is done by collecting and analyzing the data and verifying previous assumptions of the problems that triggered the review. The Electrokit can be an important tool and methodology to identify areas where the indicators of the utility are below the references, benchmarks, or regulatory standards, and what are the best practices the utility can introduce. It is very important at this step that the leadership presents a vision for the future and its commitment towards pursuing this vision. Still within this first step, usually teams define the targets the utility would like to achieve, which in turn defines the level of ambition of the action plan.

STEP 2

Prioritize activities

Subsequent to the definition of the problem and expected results, the utility will need to prioritize the areas of intervention. This prioritization is done by segmenting the activities in different dimensions of: (i) impact or effectiveness (i.e., which activities will deliver the highest impacts or benefits – e.g. cost reduction or revenue increase); (ii) timeframe (i.e., what is the best sequence of activities in the short, medium, and long term considering the expected benefits). It is very important to include short wins or quick wins in the timeframe, as it boosts morale of the team and confirms the direction is right; and (iii) efficiency (i.e., based on quantitative measures such as cost benefit analysis, which of these activities will deliver the highest returns for similar levels of investment). Lastly, this prioritization should also identify synergies and complementarities among the activities to be consolidated in a single action plan.

STEP 3

Identify resources

Based on the action plan previously defined, it will be important for the utility to seek the financial and knowledge/expertise resources, as usually these activities need investments. Some utilities may have their own teams and financial resources to implement the action plan, while others will need to seek external financing and/or bringing technical expertise (example of new technology). Some sources of financing can be concessional with favorable commercial terms, which can make the action plan more feasible to be implemented. In this step it is also important to proactively seek and obtain support from the relevant country stakeholders (e.g., government authority, regulators, industry association, etc.) and clear understanding on the expected impacts and benefits of this action plan.

STEP 4

Prepare to implement

Lastly, the utility needs to develop a detailed implementation plan, not only including the activities previously defined, but also the governance model of the implementation (e.g., definition of team responsibilities and authorities, level of dedication and subordination, etc.) and how progress will be monitored and evaluated. Adaptability becomes a key ingredient of the plan, and an important reminder is to keep into perspective that⁵ “a business/action plan can’t be a tightly crafted prediction of the future but rather a depiction of how events might unfold and a road map for change”. The results from the readiness to implement, together with seeking political support and securing the financial resources are the last activities before proceeding to implementation.

In sum, this chapter presented in general terms how utilities can develop an action plan and increase the likelihood of successful implementation, using the results from the areas of the Elektrokit.

⁵ Harvard Business Review: Updating a classic: Writing a great business plan. <https://hbswk.hbs.edu/item/updating-a-classic-writing-a-great-business-plan>.

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