GLOSSARY: KEY PERFORMANCE INDICATORS

This section serves to provide detailed definitions and Formula for the operational (Section A), financial (Section B), human resources and safety (Section C), and governance (Section D) indicators.

SECTION A: OPERATIONAL INDICATORS

Operational indicators assess the performance and functioning of a utility's technical operations and focus on the efficiency, reliability, and effectiveness of those operations. They can help identify areas for improvement, optimize resource allocation, and ensure that the utility's day-to-day operations are aligned with its overall goals and objectives. The following subsections describe the indicators related to electricity generation, transmission, distribution, and SAIDI and SAIFI.

GENERATION

The following generation KPIs will help utility providers, stakeholders, and policymakers make informed decisions, optimize operations, and support the transition to more sustainable and efficient energy generation practices.

- **Load Factor** is the ratio of the average load demand to the peak demand over a specific period, often a year. It measures the usage of production capacity and indicates the balance between average and peak loads. Load factor helps assess how efficiently generation capacity is being used.
- **Capacity Factor** is the ratio of the actual electricity generation of a power plant to its maximum potential generation capacity. It shows how consistently a power plant is producing electricity at its full capacity.
- **Availability Factor** is the ratio of the actual time a power plant is available and generating electricity to the total time in a specific period. Availability factor measures the reliability and availability of the power plant.
- **Generation Labor Productivity** measures the efficiency of labor in the power generation process. It assesses the amount of electricity generated per unit of labor input, often expressed as MWh per employee. Generation labor productivity helps evaluate workforce efficiency in power generation.
- **Specific Fuel Consumption for Diesel Fuel Oil (DFO)** measures the amount of DFO required to generate a unit of electricity, often expressed in MWh per liter. It assesses the fuel efficiency of diesel power generation.
- **Specific Fuel Consumption for Heavy Fuel Oil (HFO)** is similar to DFO-specific fuel consumption but measures the consumption of heavy fuel oil. It evaluates the fuel efficiency of power generation using HFO.
- **Specific Lubricating Oil Consumption** measures the amount of lubricating oil consumed per unit of power generated, often expressed in MWh per liter. It assesses the efficiency of lubrication systems in power generation equipment.

- **Forced Outage Indicator** represents the percentage of unplanned or forced outages compared to the total available time. It measures the reliability of power plant equipment by quantifying the frequency of unexpected shutdowns.
- **Generation Planned Outage Indicator** represents the percentage of planned outages for maintenance or upgrades compared to the total available time. It assesses the proactive maintenance and downtime scheduling of power plants.
- **Generation Operations and Maintenance (O&M) Costs per MWh** represent the total O&M expenses incurred in generating electricity, divided by the total electricity generated, expressed in the local currency unit (LCU) per MWh. It provides insights into the cost efficiency of power generation.
- **Power Station Usage or Station Auxiliaries** represents the percentage of power generated that is used for station auxiliary systems, such as cooling, lighting, and control systems. It quantifies the proportion of electricity consumed for internal plant operations.
- **IPP Generation** represents the percentage of electricity generation contributed by IPPs compared to the total generation. It measures the share of power generated by third-party entities.
- **Renewable Energy to Grid** represents the percentage of electricity generated from renewable energy sources, such as wind, solar, or hydropower, compared to the total electricity supplied to the grid. It assesses the contribution of renewable energy to the overall energy mix.

Appendix Table A.1 shows the formula for how each generation indicator is calculated.

Appendix Table A.1: Generation Indicators and Formula

KPIs	Formula
Load Factor (%)	$\frac{Average\ Load\ Demand\ (MW)}{Peak\ Demand\ (MW)}$
Capacity Factor (%)	Capacity factor is calculated separately by generation source and by utility vs. IPP. The capacity factors of several combinations of sources within and between utilities and IPPs are also calculated. In all cases, the formula for calculating capacity factor is as follows: $\frac{Source\ Generation\ (MWh)}{Source\ Capacity\ (MW) \times Hours\ in\ Period}$ Utilities will be asked to provide the amount of electricity generated by each source by the utility and its contracted IPPs, as well as the installed generation capacity for each source belonging to the utility and its contracted IPPs.
Availability Factor (%)	Availability factor is calculated separately by generation source and by utility vs. IPP. The availability factors of several combinations of sources within and between utilities and IPPs

KPIs	Formula
	are also calculated. In all cases, the formula for calculating availability factor is as follows: $\frac{(Hours\ in\ Period \times Source\ Capacity\ (MW)) - Unavailable\ Source\ Generator\ Hou}{Hours\ in\ Period \times Source\ Capacity\ (MW)}$ Utilities will be asked to provide the available and maximum available generator hours for each generation source by the utility and its contracted IPPs.
Generation Labor Productivity (MWh/employee)	$\frac{Utility\ Total\ Generation\ (MWh)}{Number\ of\ Full\ Time\ Equivalent(FT_e)\ Generation\ Employees}$
Specific Fuel Consumption – Diesel Fuel Oil (kWh/liter)	$\frac{Utility\ Diesel\ Generation\ (MWh)}{Total\ DFO\ Consumed\ (litres)} \times 1{,}000$
Specific Fuel Consumption – Heavy Fuel Oil (kWh/liter)	$\frac{Utility\ HFO\ Generation\ (MWh)}{Total\ HFO\ Consumed\ (litres)} \times 1{,}000$
Specific Lubricating Oil Consumption (kWh/liter)	$\frac{Utility\ Total\ Generation\ (MWh)}{Total\ DFO\ Consumed\ (litres)} \times 1{,}000$
Forced Outage Indicator (%)	$\frac{\sum_{i=1}^{n}(Generator\ Forced\ Outage\ Hrs\ \times Generator\ Capacity\ (MW))}{Hours\ in\ Period \times Total\ Generator\ Capacity\ (MW)}$
Generation Planned Outage Indicator (%)	$\frac{\sum_{i=1}^{n}(Generator\ Planned\ Outage\ Hrs\ \times Generator\ Capacity\ (M}{Hours\ in\ Period \times Total\ Generator\ Capacity\ (MW)}$
Generation O&M Costs per MWh (LCU/MWh)	$\frac{Generation\ O\&M\ Costs\ (LCU)}{Utility\ Total\ Generation\ (MWh)}$
Power Station Usage / Station Auxiliaries (%)	$\frac{Internal\ Electricity\ Consumption\ (MWh)}{Utility\ Total\ Generation\ (MWh)}$
IPP Generation (%)	$\frac{IPP\ Total\ Generation\ (MWh)}{Utility + IPP\ Total\ Generation\ (MWh)}$
Renewable Energy to Grid (%)	$\frac{Utility + IPP\ Total\ RE\ Generation\ (MWh)}{Utility + IPP\ Total\ Generation\ (MWh)}$

KPIs	Formula
Storage Efficiency	$\frac{Electricity\ Discharged\ from\ Utility\ Batteries}{Electricity\ Stored\ in\ Utility\ Batteries}$ $\frac{Electricity\ Discharged\ from\ IPP\ Batteries}{Electricity\ Stored\ in\ IPP\ Batteries}$ $\frac{Electricity\ Discharged\ from\ Utility\ +\ IPP\ Batteries}{Electricity\ Stored\ in\ Utility\ +\ IPP\ Batteries}$

Transmission

The following transmission KPIs relate to the efficiency and reliability of electricity supply to customers and the quality of service provided by the transmission network in maintaining continuity of power supply.

- **Transmission Losses (%)** represent the percentage of electrical energy lost during the transmission of electricity from power generation sources to distribution substations. It measures the efficiency of the transmission system.
- **Transmission Reliability (Outages per 100 km)** measures the frequency of power outages or disruptions in the transmission network per 100 km of transmission lines. It assesses the reliability and resilience of the transmission infrastructure.
- **Transmission SAIDI—Planned (Minutes/Customer)** measures the average duration of planned power interruptions per customer in minutes within the transmission network. It quantifies the planned downtime experienced by customers on average.
- **Transmission SAIDI—Unplanned (Minutes/Customer)** measures the average duration of unplanned power interruptions per customer in minutes within the transmission network. It quantifies the duration of unplanned outages experienced by customers on average.
- **Transmission SAIFI—Planned (Events/Customer)** measures the average number of planned power interruptions per customer within the transmission network. It quantifies the number of planned outages experienced by customers on average.
- **Transmission SAIFI—Unplanned (Events/Customer)** measures the average number of unplanned power interruptions per customer within the transmission network. It quantifies the number of unplanned outages experienced by customers on average.

Appendix Table A.2 shows the Formula for how each transmission indicator is calculated.

Appendix Table A.2: Transmission Indicators and Formula

KPIs	Formula

Transmission Losses (%)	$$\frac{\begin{array}{c}[Total\ Generation\ (MWh) \\ -Internal\ Consumption\ (MWh) \\ -Electricity\ Sold\ to\ Transmission\ Customers\ (MWh) \\ -Electricity\ Input\ to\ Distribution\ Network\ (MWh)]\end{array}}{\begin{array}{c}[Total\ Generation\ (MWh) \\ -Internal\ Consumption\ (MWh)]\end{array}}$$
Transmission Reliability (Outages/100 km)	$$\frac{Number\ of\ Transmission\ Outages}{Length\ of\ the\ Transmission\ Network\ (km)} \times 100$$
Transmission SAIDI—Planned (Minutes/Customer)	$$\frac{Duration\ of\ Planned\ Transmission\ Outages\ (minutes)}{Number\ of\ Customers\ Served\ by\ the\ Transmission\ Network}$$
Transmission SAIDI—Unplanned (Minutes/Customer)	$$\frac{Duration\ of\ Unplanned\ Transmission\ Outages\ (minutes)}{Number\ of\ Customers\ Served\ by\ the\ Transmission\ Network}$$
Transmission SAIFI—Planned (Events/Customer)	$$\frac{Number\ of\ Planned\ Transmission\ Outage\ Events}{Number\ of\ Customers\ Served\ by\ the\ Transmission\ Network}$$
Transmission SAIFI—Unplanned (Events/Customer)	$$\frac{Number\ of\ Unplanned\ Transmission\ Outage\ Events}{Number\ of\ Customers\ Served\ by\ the\ Transmission\ Network}$$

Distribution

The following operational KPIs relate to the efficiency, reliability, productivity, and cost management of the distribution segment of the energy utility system. These metrics help evaluate the performance and effectiveness of the distribution network.

- **Network Delivery Losses (%)** represent the percentage of electricity lost during the delivery of electricity from distribution substations to end users. These losses include technical and non-technical losses, and they reflect the efficiency of the distribution network.
- **Distribution Transformer Utilization Factor (%)** measures the average load on distribution transformers in relation to their capacity, typically expressed as a percentage. It assesses how efficiently distribution transformers are utilized to meet customer demands.
- **Distribution Reliability (Events/100 km)** measures the frequency of power outages or disruptions in the distribution network per 100 kilometers of distribution lines. It quantifies the reliability of the distribution infrastructure and its impact on customers.
- **Customers per Distribution Employee** measures the number of customers or connections served by each full-time equivalent distribution employee. It evaluates labor productivity in the distribution segment of the energy utility.
- **Distribution O&M Expenses per km Line Length (LCU/km)** represents the total O&M expenses incurred in the operations and maintenance of the distribution network, divided by the length of distribution lines in kilometers. It assesses the cost efficiency of maintaining the distribution infrastructure.

Appendix Table A.3 shows the Formula for how each distribution indicator is calculated.

Appendix Table A.3: Distribution Indicators and Formula

KPIs	Formula
Network Delivery Losses (%)	$$\frac{[Utility + IPP\ Total\ Generation\ (MWh) - Internal\ Consumption\ (MWh) - Electricity\ Sold\ (MWh)]}{[Utility + IPP\ Total\ Generation\ (MWh) - Internal\ Consumption\ (MWh)]}$$
Distribution Transformer Utilization Factor (%)	$$\frac{Transformer\ Average\ Load\ (MVA)}{Total\ Capacity\ of\ Distribution\ Transformers\ (MVA)}$$
Distribution Reliability (Events/100 km)	$$\frac{Total\ Distribution\ Forced\ Outage\ Events}{Total\ Length\ of\ Distribution\ Lines\ (km)} \times 100$$
Customers per Distribution Employee	$$\frac{Number\ of\ Customers\ in\ Service\ Area}{Total\ Number\ of\ FT_e\ Distribution\ Employees}$$
Distribution O&M Expenses per km Line Length (LCU/km)	$$\frac{\boldsymbol{Distribution\ O\&M\ Costs\ (LCU)}}{\boldsymbol{Total\ Length\ of\ Distribution\ Lines\ (km)}}$$

SAIDI and SAIFI

The following operational indicators relate to the reliability of the electricity supply to customers. SAIDI and SAIFI are important metrics for assessing the quality of service provided by an energy utility and its impact on customers' continuity of power supply.

- **Unplanned SAIDI (Minutes/Customer)** measures the average duration of unplanned power interruptions experienced by customers in minutes. It quantifies the average amount of time customers are without electricity due to unplanned or planned outages. SAIDI is typically expressed in customer minutes per year.
- **Unplanned SAIFI (Events/Customer)** measures the average number of unplanned power interruptions experienced by customers. It quantifies the average number of power outage events per customer over a specific period, often a year. SAIFI is typically expressed as events per customer per year.
- **Planned SAIDI (Minutes/Customer)** measures the average duration of planned power interruptions experienced by customers in minutes. It quantifies the average amount of time customers are without electricity due to unplanned or planned outages. SAIDI is typically expressed in customer minutes per year.
- **Planned SAIFI (Events/Customer)** measures the average number of planned power interruptions experienced by customers. It quantifies the average number of power outage events per customer over a specific period, often a year. SAIFI is typically expressed as events per customer per year.

Appendix Table B.4 shows the Formula for how the SAIDI and SAIFI indicators are calculated.

Appendix Table B.4: SAIDI and SAIFI Indicators and Formula

SAIDI and SAIFI Indicators (Unit)	Formula
Unplanned SAIDI (Minutes/Customer)	$\frac{Total\ Unplanned\ Customer\ Minutes\ of\ Interruption}{Total\ Number\ of\ Customers\ Affected}$
Unplanned SAIFI (Events/Customer)	$\frac{Total\ Number\ of\ Unplanned\ Interruptions}{Total\ Number\ of\ Customers\ Affected}$
Planned SAIDI (Minutes/Customer)	$\frac{Total\ Planned\ Customer\ Minutes\ of\ Interruption}{Total\ Number\ of\ Customers\ Affected}$
Planned SAIFI (Events/Customer)	$\frac{Total\ Number\ of\ Planned\ Interruptions}{Total\ Number\ of\ Customers\ Affected}$

SECTION B: FINANCIAL INDICATORS

The following financial indicators will be used to evaluate the financial performance, efficiency, and financial health of a utility:

- **Operating Cost Recovery (%)** measures the percentage of a utility's operating costs recovered through the revenue the utility earns.
- **Operating Ratio (%)** is a financial metric that assesses the efficiency of the utility's operations by comparing the costs of goods and services to the revenue earned.
- **Debtor Days** measures the average number of days it takes for the utility to collect debts (receivables) owed to it. It assesses the efficiency of debt collection and cash flow management.
- **Current Ratio** is a financial ratio that measures the utility's ability to pay its short-term obligations (current liabilities) using its current assets.
- **Debt-to-Equity Ratio** is a financial metric that represents the ratio of total liabilities to equity. It assesses the capital structure of the utility and its level of financial leverage.
- **Return on Assets (ROA) (%)** is a financial indicator that measures the return generated from the utility's investment in its assets. ROA indicates how efficiently management uses its assets to generate earnings.
- **Return on Equity (ROE) (%)** is a financial metric that measures the financial returns on the owners' funds invested in the utility. It assesses the profitability and performance of the utility in generating returns for its shareholders.
- **EBITDA Margin (%)** is a measure of the profitability of a utility's operations before accounting for debt, taxes, and costs to maintain the utility's asset base.
- **EBIT Margin (%)** is a measure of the profitability of a utility's operations after accounting for costs to maintain the utility's asset base, but before accounting for debt and taxes.
- **Profit Margin (%)** measures the profitability of a utility's operations inclusive of all costs.

- **Tariff Impact** refers to the effect or consequence of the utility's tariff structure on different customer categories. It assesses how the utility's pricing policies impact the size of monthly bills of customers with varying levels of electricity usage across customer categories (such as residential, commercial, or industrial).
- **Utility Cost Breakdown** provides a detailed breakdown of the various cost categories incurred by the utility in its operations, including fuel and lubrication costs, generation O&M costs, labor, taxes, and miscellaneous expenses. It helps analyze and understand the composition of the utility's expenses.

Appendix Table B.1 describes how the financial indicators are calculated.

Appendix Table B.1: Financial Indicators and Formula

Financial KPIs	Formula
Operating Costs Covered by Subsidies	$\frac{GS}{CoS + OOE - BDE + T}$ GS is government subsidies; CoS is Cost of Sales; OOE is Other Operating Expenses; BDE is Bad Debt Expense; and T is Taxes.
Operating Cost Recovery (%)	$\frac{Revenue}{[Cost\ of\ Sales + Other\ Operating\ Expenses - Bad\ Debt\ Expense + Income\ Tax]}$
Operating Ratio (%)	$\frac{Cost\ of\ Sales + Other\ Operating\ Expenses}{Revenue}$
Debtor Days	$\frac{Trade\ Receivables}{Revenue} \times 365$
Current Ratio	$\frac{Total\ Current\ Assets}{Total\ Current\ Liabilities}$
Debt-to-Equity Ratio	$\frac{Total\ Liabilities}{Total\ Equity}$
Return on Assets (%)	$\frac{Profit}{Total\ Assets}$
Return on Equity (%)	$\frac{Profit}{Total\ Equity}$
EBITDA Margin (%)	$\frac{Revenue + Other\ Income - Cost\ of\ Sales - Other\ Operating\ Expenses}{Revenue}$
EBIT Margin (%)	$\frac{[Revenue + Other\ Income - Cost\ of\ Sales - Other\ Operating\ Expenses - Depreciation\ Expense - Amortization\ Expense]}{Revenue}$

Financial KPIs	Formula
Profit Margin (%)	$\frac{Profit}{Revenue}$
Tariff Impact (USD)	Utilities will enter tariff schedules and structures for residential, commercial, and industrial customers. If applicable, tariffs for customers on prepaid meters and postpaid meters will be entered separately. Monthly bills will be calculated for Residential Customers using 100 kWh, 200 kWh, and 500 kWh; for Commercial Customers using 1,000 kWh and 5,000 kWh; and Industrial Customers using 10,000 kWh. All values will be converted to USD for ease of comparison across utilities.
Utility Cost Breakdown (%)	Utilities will enter information about their costs in each of the following categories: Generation O&M Costs, Power Purchase Costs, Transmission and Distribution O&M Costs, Other Labor Expenditure, Other Expenditure, Duty on Fuel & Lube Oil, Generation Labor, Transmission Labor, Distribution Labor, and Other Duty & Taxes. Each category will be divided by the sum of all categories to determine the percentage of the utility's costs each category represents.

SECTION C: HUMAN RESOURCES AND SAFETY

This section includes indicators related to safety, human resources, and gender diversity of the utilities' workforce. Safety and human resources indicators include the following:

- **Lost Time Injury Duration Rate (Days)** measures the average duration of time lost per employee due to work-related injuries that result in lost working hours. It quantifies the amount of time employees are unable to work due to injuries and provides insights into workplace safety and health.
- **Lost Time Injury Frequency Rate (Incidents per Million Hours)** measures the frequency of work-related injuries that result in lost working hours per million hours worked by employees. It assesses the rate of injury incidents in the workplace, helping evaluate safety performance.
- **Overall Labor Productivity** measures the efficiency of the workforce by evaluating the number of customers served per full-time equivalent (FTE) employee. It assesses the productivity of the workforce in providing services to customers and is often expressed as customers per FTE employee.

Appendix Table C.1 shows the Formula for how each human resource and safety indicator is calculated.

Appendix Table C.1: Human Resources & Safety Indicators and Formula

HR & Safety KPIs	Formula

Lost Time Injury Duration Rate (Days/Employee)	$\frac{Hours\ Lost\ to\ Work\ Related\ Injuries \times 8}{Total\ Number\ of\ Male\ Employees + Total\ Number\ of\ Female\ Employ}$
Lost Time Injury Frequency Rate (Number of Incidents per Million Hours)	$\frac{Number\ of\ Work\ Related\ Injuries}{Total\ Hours\ Worked} \times 1{,}000{,}000$
Overall Labor Productivity (Customers/Employee)	$\frac{Number\ of\ Customers}{Total\ Number\ of\ Male\ Employees + Total\ Number\ of\ Female\ Employ}$

Gender indicators show the gender makeup of the utility's workforce. The gender profile reveals the proportion of women and men in leadership positions and by functional divisions.

Appendix Table C.2 details the data points on the gender composition of the utility workforce.

Appendix Table C.2: Data on Workforce Gender Diversity

Data Reported by Utilities	Gender Diversity Indicators
Number of Male Employees	Total Number of Employees, % Male Employees, % Female Employees
Number of Female Employees	
Is the utility's CEO male?	% Male CEOs, % Male 2nd in Command
Is the utility's 2nd in command male?	
Number of Male Executive Staff	Total Number of Executive Staff, % Male Executive Staff, % Female Executive Staff
Number of Female Executive Staff	
Number of Male Technical Staff	Total Number of Technical Staff, % Male Technical Staff, % Female Technical Staff
Number of Female Technical Staff	
Number of Male Finance Staff	Total Number of Finance Staff, % Male Finance Staff, % Female Finance Staff
Number of Female Finance Staff	
Number of Male Procurement Staff	Total Number of Procurement Staff, % Male Procurement Staff, % Female Procurement Staff
Number of Female Procurement Staff	
Number of Male HR Staff	Total Number of HR Staff,

Data Reported by Utilities	Gender Diversity Indicators
Number of Female HR Staff	% Male HR Staff, % Female HR Staff
Number of Male PR, Customer Service, and Communications Staff	Total Number of PR, Customer Service, and Communications Staff; % Male PR, Customer Service, and Communications Staff; % Female PR, Customer Service, and Communications Staff
Number of Female PR, Customer Service, and Communications Staff	
Number of Male Administrative Staff	Total Number of Administrative Staff, % Male Administrative Staff, % Female Administrative Staff
Number of Female Administrative Staff	
Number of Male ICT Staff	Total Number of ICT Staff, % Male ICT Staff, % Female ICT Staff
Number of Female ICT Staff	

SECTION D: GOVERNANCE

The questions shown in Appendix Table D.1 below evaluate the effectiveness of governance mechanisms and whether good governance leads to tangible benefits in terms of better financial or operational performance.

Appendix Table D.1: Good Governance Practices

Governance Question	Good	Poor
Basis for effective corporate governance:		
Is a Code of Conduct in place?	Yes	No
Is the Code of Conduct implemented?	Yes	No
Is a commercial mandate in place?	Yes	No
Is a commercial mandate implemented?	Yes	No
Is the CEO on a performance contract?	Yes	No
Does the CEO's performance contract include annual reviews?	Yes	No
Rights and equitable treatment of shareholders:		
Are Ministers appointed to the Board?	No	Yes

Are Ministers or public servants representing the line/sector Ministry appointed to the Board?	No	Yes
Disclosure and transparency:		
Is the Annual Report completed within four months of the end of the reporting year?	Yes	No
Is the Annual Report audited?	Yes	No
Does the Annual Report disclose performance against the Strategic Plan?	Yes	No
Strategic Alignment:		
Has a Strategic Plan been adopted?	Yes	No
Does the Strategic Plan include three years of forecasts?	Yes	No
Is the Strategic Plan implemented?	Yes	No