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An Indra company

User Guide

Energy Reporting Tool

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Kenya Power

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1 Introduction

The Energy Reporting Tool (ERT) is an web-based application designed to enable energy companies to calculate energy losses over time. The reports generated by the application allows clients to find the cause of losses within their energy network. This document is a user guide that will assist users of the system to navigate it efficiently and carry out all necessary tasks.

2 Accessing the System

To access ERT,a link will be provided. The first screen that the user meets is the logins screen. Here, the user enters a username and password and clicks the Sign In button. There is also a check box with text 'Remember me' that enables the user to save their username. This means that in the next login attempt, the user will only input their password to log in.

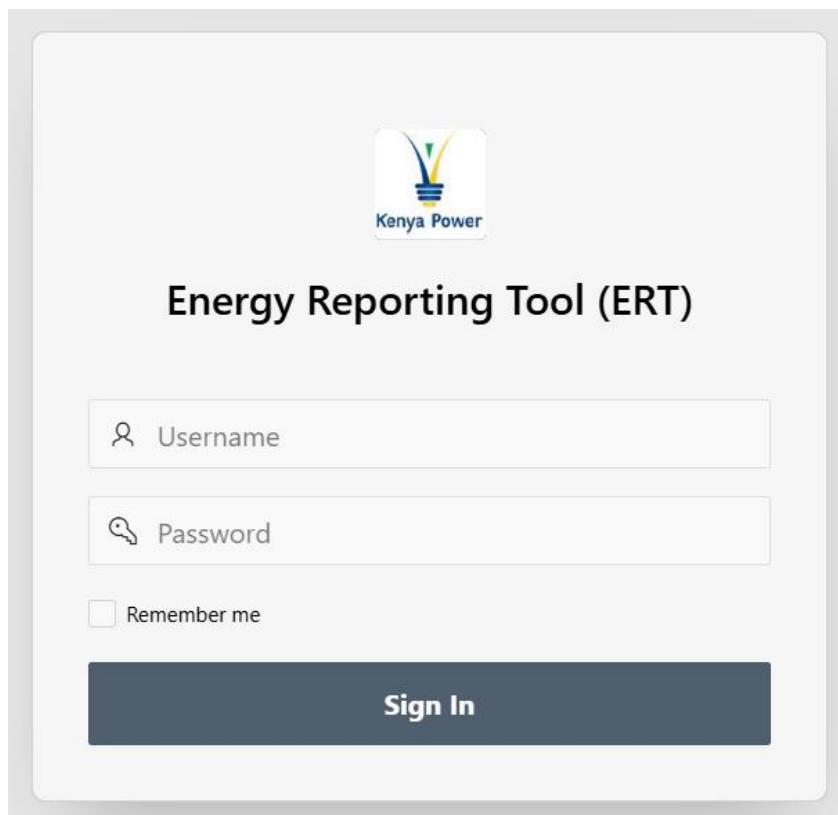


Figure 2.1: Login Page

3 Navigating the System

On logging in successfully, a user will be taken to the Home window. At the top, there is a bar that shows the application on the left and some action button on the right. To the left, there is a sidebar that allows navigation to the entire application. The sidebar is collapsible by clicking the icon to the left of the application name. To the right of the sidebar is where the application content is displayed. From Figure 3.1, we can see that we are in the Home window. The sub-sections that follows breakdown the application further.

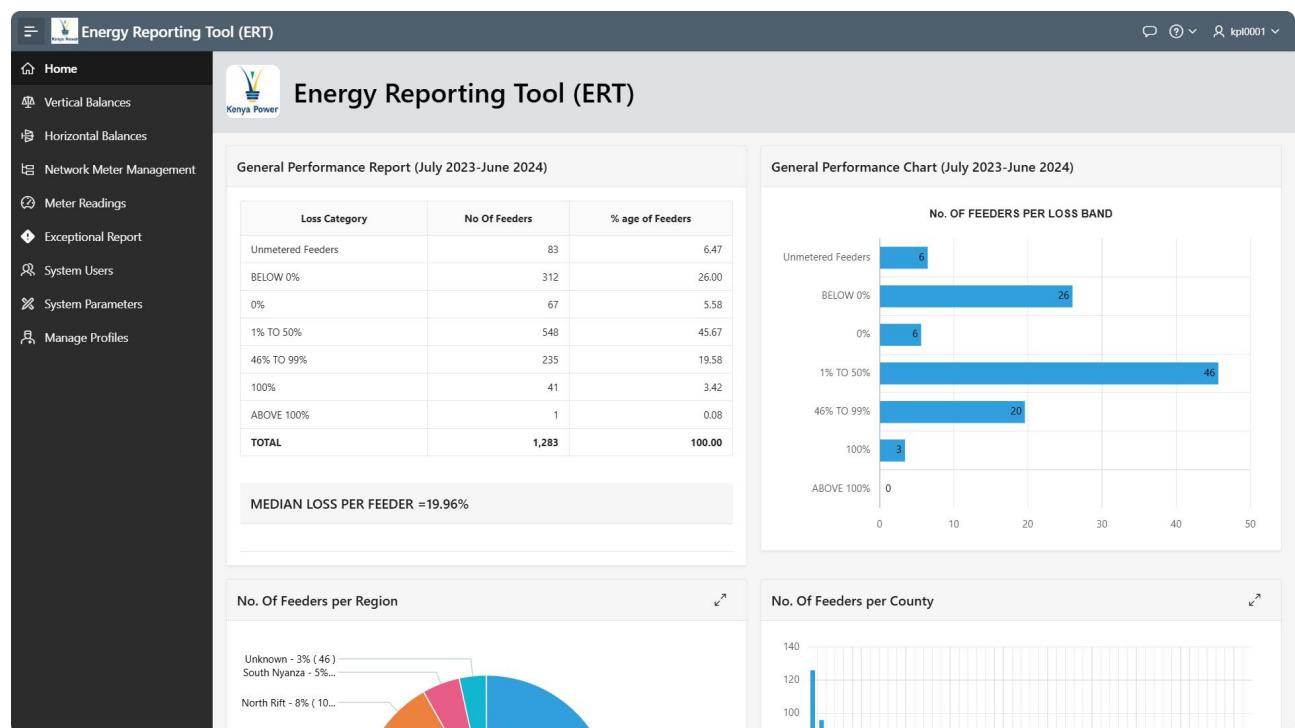


Figure 3.1: Landing Page

3.1 Top Bar

The top bar, shown below, can be divided in to the left and right sections.



Figure 3.2: Top Bar

There are two items in the left section. These are:

- Open/Close Navigation Button - This is labeled 1 and is to use to either open or close the side navigation bar.
- Application Title - Labeled 2, this is the title of the application. On its left is the KPLC logo.

There are 3 items in the right section. These are:

- Feedback Button - Labeled 3, this button opens a modal that enables the user to give feedback on the application.
- Help Button- Labeled 4, this button opens a dropdown with two options, Page Help and About Page. The Page Help button opens a modal that provides help information about the page. The About Page opens a modal that gives more information about the page.

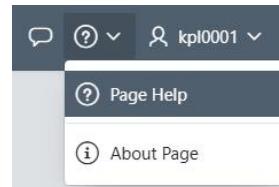


Figure 3.3: Help Button Dropdown

- User Profile Button - Labeled 5, this button shows the username of the currently logged in user. When clicked, it opens a dropdown with two options, one to change the password and the other to log out. This is shown in the image below.

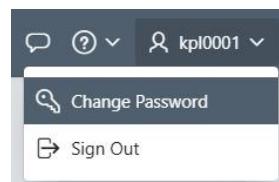


Figure 3.4: User Profile Button Dropdown

3.2 Side Navigation Bar

The navigation bar contains the following items:

- Home
- Vertical Balances
- Horizontal Balances
- Network Meter Management
- Meter Readings
- Exceptional Report
- System Users
- System Parameters
- Manage Profiles

This is shown in the image below. In next chapter, each page is discussed in detail.

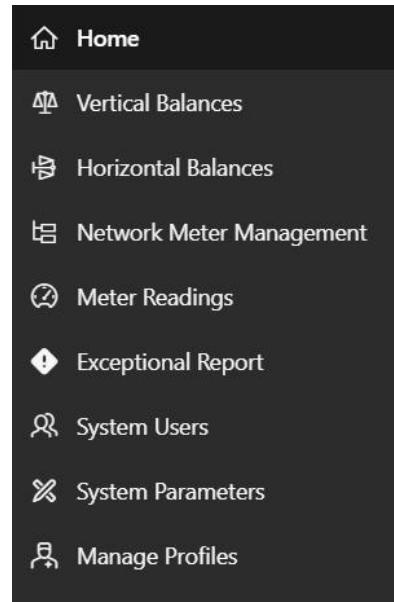


Figure 3.5: Side Navigation Bar

4 ERT Windows

In this chapter, each window in ERT will be discussed thoroughly. The structure is as follows. We will start by discussing the user interface of each window and what it comprises of. Next, we will discuss the processes that will be carried out in that window.

It should be noted that the windows described here are all the windows available in the ERT system. Based on the user profile, a user may not be able to view all the windows or carry out all processes described in the user guide.

4.1 Home

This is the landing page of the application. It contains a summary of reports from the annual report and feeder network. There are 4 reports displayed. These are:

- **General Performance Report** - This is a table that groups the feeders based on their losses and divides them into categories/ bands.
- **General Performance Chart** - This is a horizontal bar chart of the General Performance Report.
- **No. of Feeders per Region** - This is a pie chart showing the distribution of feeders per region. Hovering on any one region will isolate it and give you more information about it.
- **No. of Feeders per County** - This is a vertical bar chart showing the distribution of feeders per county, ordered from the highest to the lowest.

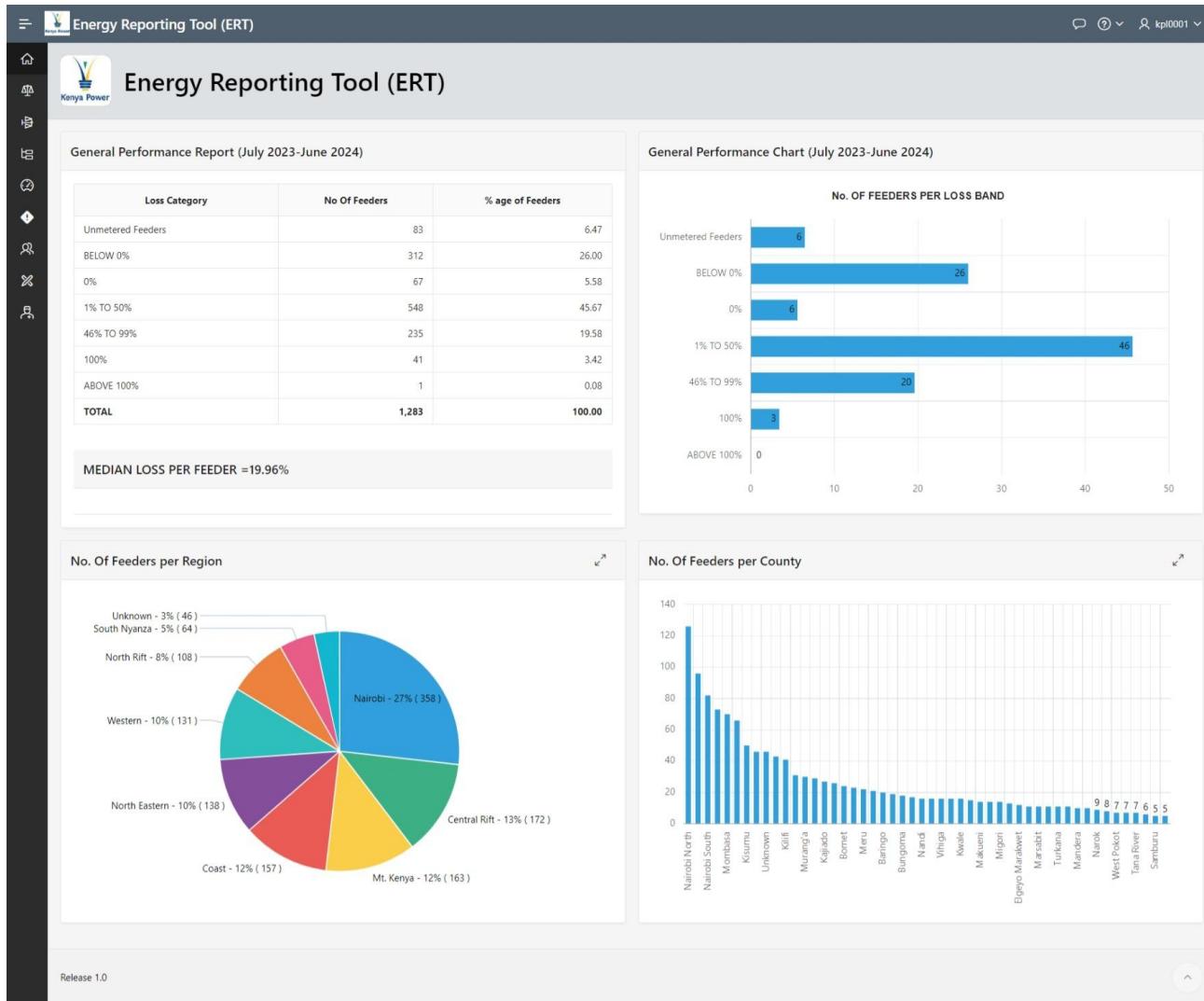


Figure 4.1: Home Window

4.2 Vertical Balances

The Vertical Balances window contains one of the main functionalities of the application, generating vertical energy loss reports. Vertical energy loss reports are reports on energy loss from transmission to customer consumption. Figure 4.2 shows how the Vertical Balances window appears in ERT.

Figure 4.2: Vertical Balances Window

The window is divided into two sections. These are the selection criteria and report sections. In Figure 4.3, they are labeled 1 and 2 respectively.

Figure 4.3: Vertical Balances Window Sections

In the selection criteria, a user selects the criteria that will be used to generate the reports to be displayed in the reports section. The criteria include the calculation type, the date period and network options.

4.2.1 Calculation Types

There are three calculation types. These are:

- Monthly Period
- Billing Cycle
- Prorated Period

4.2.1.1 Monthly Period

When this is selected, the values generated are constrained to between the first day and the last day of the calendar month.

4.2.1.2 Billing Cycle

When this is selected, the values generated are constrained to between the 5th of the previous month and the 4th of the current month. This is in alignment with KPLC's billing cycle.

4.2.1.3 Prorated Period

When this is selected, customer consumption that span more than one month and are under one bill are split to obtain the daily consumption, which is used to calculate the monthly consumption.

Example:

If a customer was billed one bill for the period between 25th January and 3rd March, their total consumption for that period will be divided by the number of days in that period (25th Jan - 3rd Mar) to obtain the daily consumption. This daily consumption can be used to calculate customer's consumption for the month of February, i.e. Daily Consumption * Number of Days in February

4.2.2 Date Period

This contains two dropdowns; one to select the Start Month when the report should begin and, one to select the End Month when the report should end.

4.2.3 Network Options

This is a dropdown that allows the user to select which network element they want them report to contain. It only allow selection of one network element. The network elements available in the dropdown list are:

- Feeder 66
- LV Circuit
- None
- Primary Feeder
- Primary Substation
- Secondary Substation
- Transmission Feeder
- Transmission Substation

The 'None' option refers to no specific network element. Rather, when selected, all network elements will be included in the reports generated. The dropdown list is shown in Figure 4.4.

Network Options

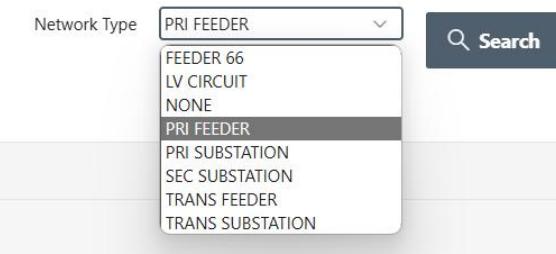


Figure 4.4: Network Options Dropdown

4.2.4 Reports Section

In the reports section, there are a couple of reports generated. These include the following:

- Monthly Energy Balances
- Cumulative Energy Balances
- Per Region Report
- Per County Report
- Execution Analysis Report

4.2.4.1 Monthly Energy Balances

This report contains the losses of each feeder meter per month. See Figure 4.4 below.

Vertical Balances													
Monthly													
Region	County	Month	Network Name	Network Id	Meter No	Calculation Type	Dispatched (kWh)	Feed Out (kWh)	Sale (kWh)	Line Losses (kWh)	Loss (kWh)	% Loss (kWh)	Execution Month
Coast	Mombasa	202312	DIGO 11KV EX MBARAKI	208000103	40013031688	Monthly	1,651,530.00	0	3,223,462.72	0	-1,571,932.72	-95.18	202312
Coast	Mombasa	202402	DIGO 11KV EX MBARAKI	208000103	40013031688	Monthly	1,830,216.00	0	3,636,633.20	0	-1,805,417.20	-98.70	202402
Coast	Mombasa	202403	DIGO 11KV EX MBARAKI	208000103	40013031688	Monthly	1,938,174.00	0	3,983,135.79	0	-2,044,961.79	-105.51	202403
Coast	Mombasa	202307	DIGO 11KV EX TONONOKA	208001211	40010111867	Monthly	0.00	0	1,190,680.43	0	-1,190,680.43	0.00	202307
Coast	Mombasa	202308	DIGO 11KV EX TONONOKA	208001211	40010111867	Monthly	0.00	0	1,263,508.51	0	-1,263,508.51	0.00	202308
Coast	Mombasa	202309	DIGO 11KV EX TONONOKA	208001211	40010111867	Monthly	4,570,560.00	0	1,313,424.10	0	3,256,817.90	71.26	202309
Coast	Mombasa	202310	DIGO 11KV EX TONONOKA	208001211	40010111867	Monthly	1,633,520.00	0	1,265,547.10	0	367,972.90	22.53	202310
Coast	Mombasa	202311	DIGO 11KV EX TONONOKA	208001211	40010111867	Monthly	1,636,280.00	0	1,355,052.54	0	281,227.46	17.19	202311
Coast	Mombasa	202312	DIGO 11KV EX TONONOKA	208001211	40010111867	Monthly	1,785,200.00	0	1,400,322.13	0	384,877.87	21.56	202312
Coast	Mombasa	202401	DIGO 11KV EX TONONOKA	208001211	40010111867	Monthly	1,887,440.00	0	1,478,586.99	0	408,853.01	21.66	202401
Coast	Mombasa	202402	DIGO 11KV EX TONONOKA	208001211	40010111867	Monthly	1,769,360.00	0	1,428,607.05	0	340,752.95	19.26	202402
Coast	Mombasa	202403	DIGO 11KV EX TONONOKA	208001211	40010111867	Monthly	2,033,320.00	0	1,564,644.72	0	468,675.28	23.05	202403
Coast	Mombasa	202307	ENDI TEXTILE 11KV EX MIRITINI	208000121	40010111844	Monthly	0.00	0	1,857,358.15	0	-1,857,358.15	0.00	202307
Coast	Mombasa	202308	ENDI TEXTILE 11KV EX MIRITINI	208000121	40010111844	Monthly	0.00	0	1,886,929.87	0	-1,886,929.87	0.00	202308
Coast	Mombasa	202309	ENDI TEXTILE 11KV EX MIRITINI	208000121	40010111844	Monthly	4,760,450.00	0	1,840,118.27	0	2,920,311.73	61.56	202309

Figure 4.5: Monthly Vertical Energy Balances Report

4.2.4.2 Cumulative Energy Balances

This report contains the cumulative losses of each feeder meter based on the date period defined by the user. It can be used to generate annual, semi-annual and quarterly reports. See Figure 4.5 below.

Region	County	Network Id	Network Name	Meter No	Dispatched (kWh)	Feed Out (kWh)	Sale (kWh)	Line Losses (kWh)	Loss	%Loss
Coast	Mombasa	208000121	ENDI TEXTILE 11KV EX MIRITINI	40010111844	1,598,000.00	0	1,834,476.81	0	-236,476.81	-14.80
Coast	Mombasa	208000164	BAMBURI 3 33KV EX KIPEVU	4002000246	6,881,040.00	9,364,169	0.00	0	-2,483,129.00	-36.09
Coast	Mombasa	208000136	BAMBURI 3 33KV EX NEW BAMBURI	4002000722	13,680.00	0	0.00	0	13,680.00	100.00
Coast	Mombasa	208002883	GIL 33KV EX KIPEVU	4002000900	2,749,200.00	0	0.00	0	2,749,200.00	100.00
Coast	Mombasa	208000325	KINANGONI 33KV EX NEW BAMBURI	4002000667	0.00	133,240	54,383.76	0	-187,623.76	0.00
Coast	Mombasa	208000141	KPR 1 33KV EX KIPEVU	400103031608	5,920,331.00	0	0.00	0	5,920,331.00	100.00
Coast	Mombasa	208000142	KPR 2 33KV EX KIPEVU	4002000247	0.00	0	21,775.56	0	-21,775.56	0.00
Coast	Mombasa	208000143	KPR 3 33KV EX KIPEVU	400103031545	0.00	5,198,240	55,074.99	0	-5,253,314.99	0.00
Coast	Taita Taveta	208002755	CHAWIA 11KV EX MWATATE	Not Metered	0.00	0	98,293.58	0	-98,293.58	0.00
Coast	Taita Taveta	208002755	CHAWIA 11KV EX MWATATE	Not Metered	0.00	0	91,643.73	0	-91,643.73	0.00
Coast	Taita Taveta	208002755	CHAWIA 11KV EX MWATATE	Not Metered	0.00	0	76,883.60	0	-76,883.60	0.00
Coast	Taita Taveta	208002648	MSAU 11 KV EX VOI	Not Metered	0.00	0	82,448.79	0	-82,448.79	0.00
Coast	Taita Taveta	208002648	MSAU 11 KV EX VOI	Not Metered	0.00	0	75,656.15	0	-75,656.15	0.00
Coast	Taita Taveta	208000308	MWATATE 11KV EX MWATATE	4002000063	359,980.00	0	333,457.33	0	26,522.67	7.37
Coast	Taita Taveta	208002647	SAGHALA 11 KV EX VOI	Not Metered	0.00	0	61,316.73	0	-61,316.73	0.00
			SAGHALA 11 KV EX VOI	Not Metered	0.00	0	64,433.78	0	-64,433.78	0.00

Figure 4.6: Cumulative Vertical Energy Balances Report

4.2.4.3 Per Region Report

This report contains a summary of the cumulative energy balance grouped by region. See Figure 4.6 below.

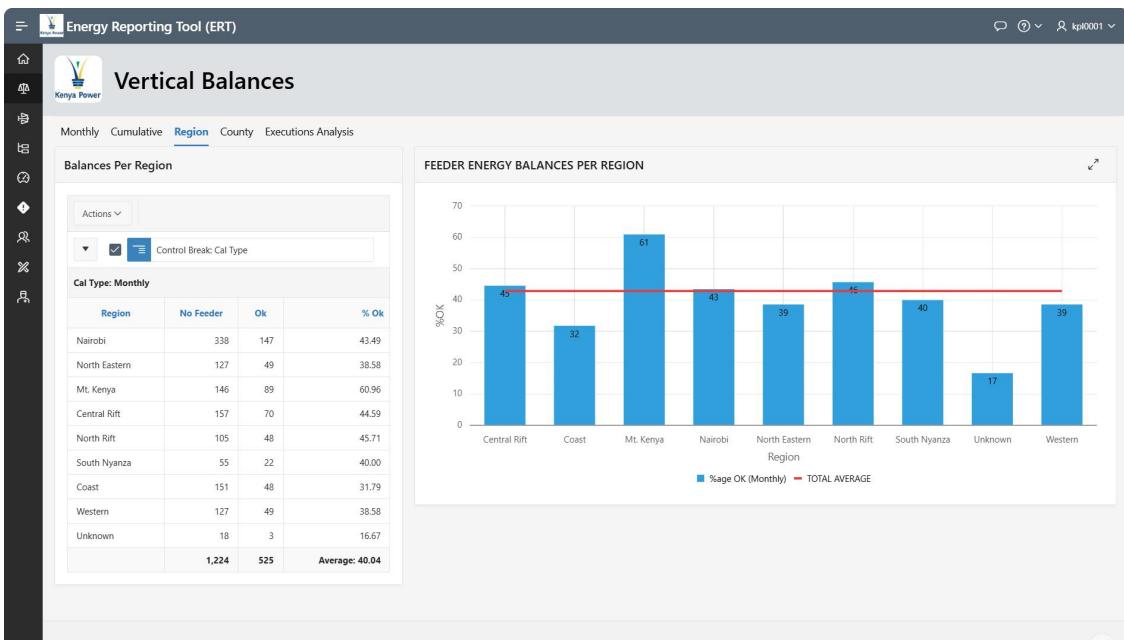


Figure 4.7: Per Region Report

4.2.4.4 Per County Report

This report contains a summary of the cumulative energy balance grouped by county. See Figure 4.7 below.

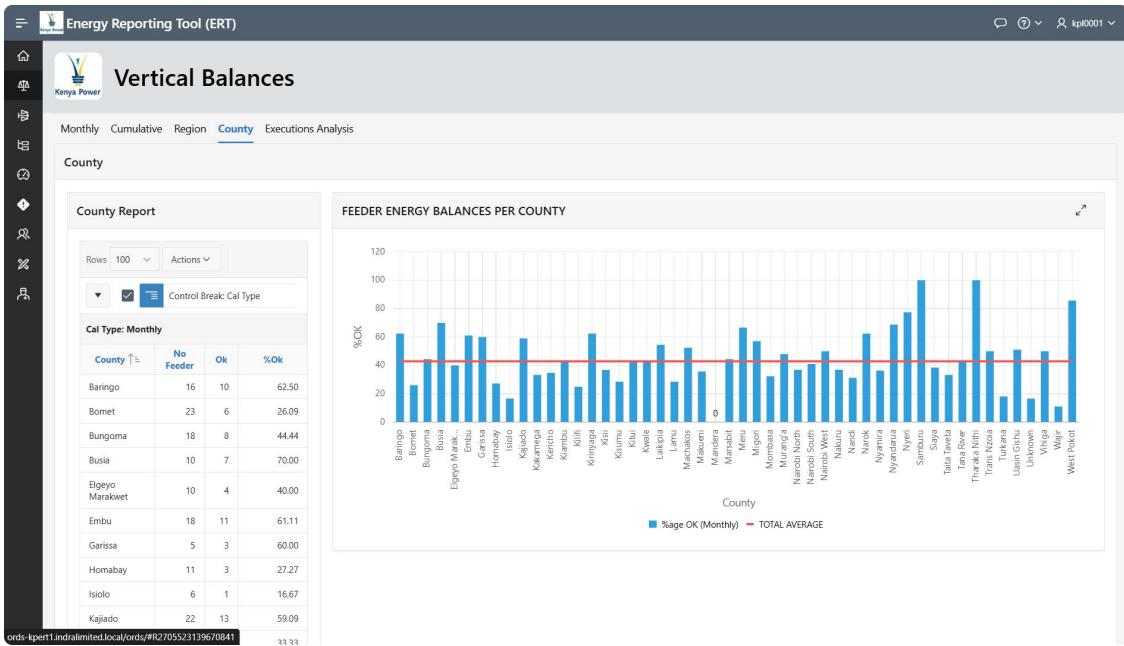


Figure 4.8: Per County Report

4.2.4.5 Execution Analysis Report

This report contains a table that shows the results of the different report executions that have been done over time. This enables the user to see how the losses changes as rebilling is done over time. A user can also schedule an execution by clocking the "Schedule Execution" button at the right side of the screen.

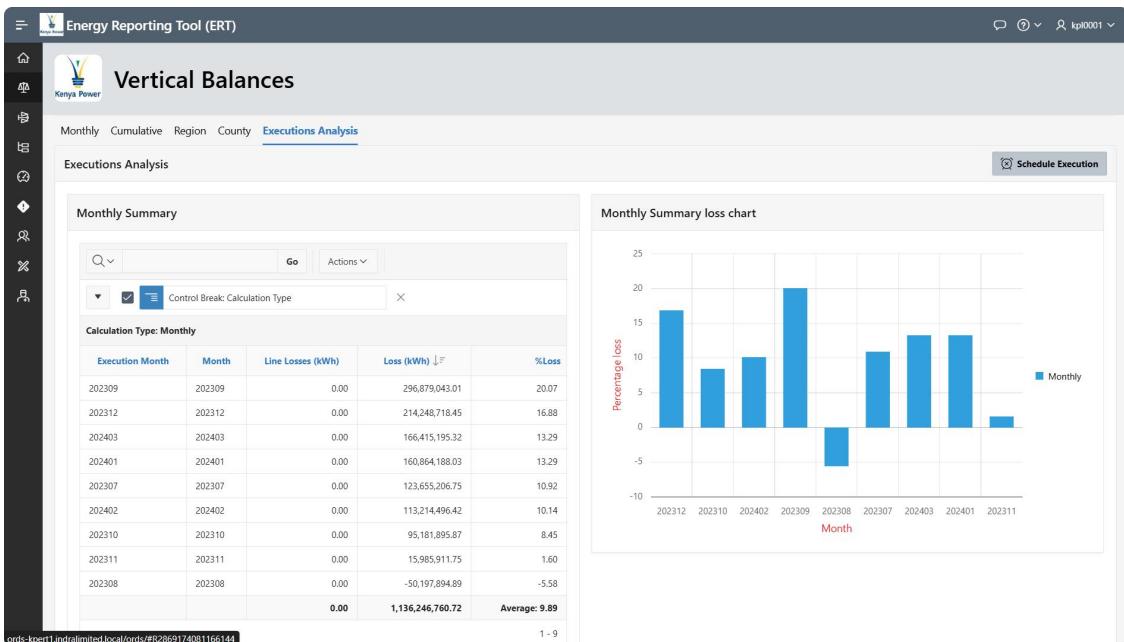


Figure 4.9: Execution Analysis Report

Clicking the Schedule Execution button opens up a modal as shown in the image below. The image has two tabs; the Scheduled Executions and Schedule Execution tabs.

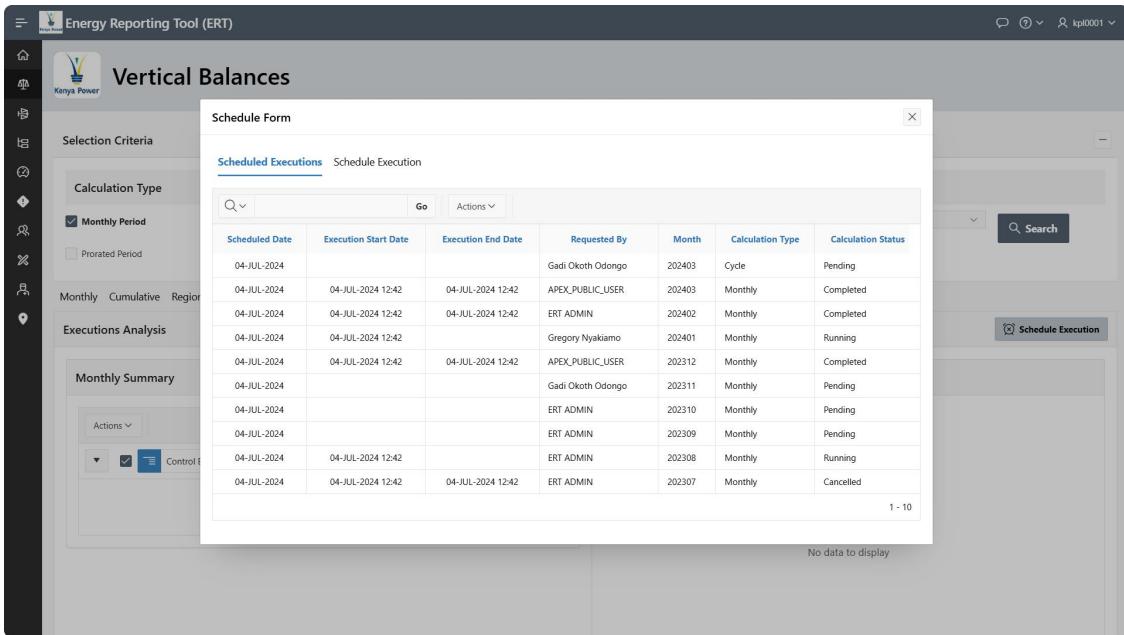


Figure 4.10: Schedule Form Modal

The Scheduled Executions tab has a table that contains details of previous executions. From here, a user can see the status of the execution they had scheduled. This status is shown in the Calculation Status column. There are four statuses than a scheduled execution can be in. These are:

- Pending
- Running
- Completed
- Cancelled

The first status that a schedule execution is in is status Pending. This means that it is yet to be executed. The next status moves to is Running. This means that the balance is being executed. After successful running, the status changes to Completed. A scheduled execution can move to Cancelled status if the user decides to cancel the execution. This is only possible if the status was Pending.

The Schedule Execution tab contains a form that the user fills in to schedule an execution for a future date. This is shown in the image below.

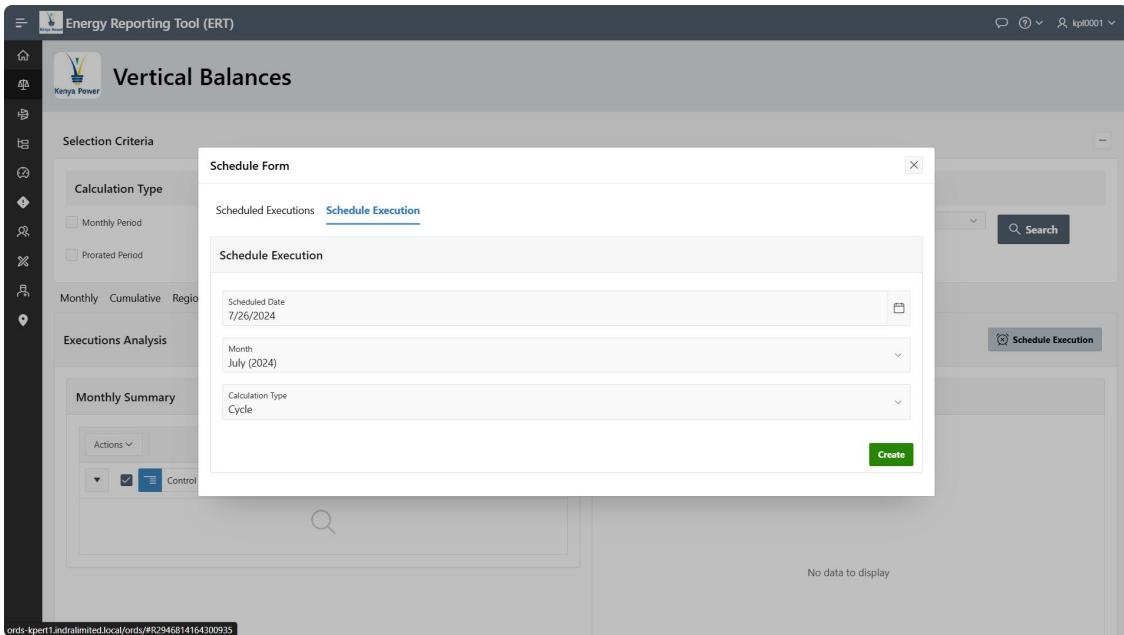


Figure 4.11: Schedule Execution Tab in Schedule Form Modal

4.2.5 Processes

The processes that can be carried out in the Vertical Balances window include calculating vertical balances and scheduling the execution of calculation of a balance for a later period.

4.2.5.1 Calculating Vertical Balances

To calculate vertical balances, follow the following steps:

1. Select the calculation type. There are three calculation types. The calculation types have been described in section 4.2.4.2.1.
2. Select the period for which you want to calculate the balances for. Select a start month and an end month. The end month should be greater than the start month.
3. Select the network type for which you want to calculate the balances for. This is the network option section which has been discussed in section 4.2.3.
4. Click the search icon to the right of the network type dropdown.

After clicking the search icon, the balance will be generated with each tab in the reports section being populated with data.

4.2.5.2 Scheduling Balance Execution

To schedule a balance execution, follow the following steps:

1. Click the Execution Analysis tab in the reports section.
2. Click the schedule execution button on the right. It should look similar to the image below. On clicking the button, a modal should appear as shown in Figure 4.10.

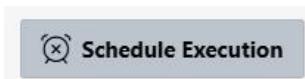


Figure 4.12: Schedule Balance Execution Button

3. Click the Schedule Execution tab. A similar form should appear as in shown in Figure 4.11.
4. Select schedule date. The date should be greater than or equal to the current date.
5. Select the month for which you want to recalculate the balance.
6. Select the calculation type as defined in section 4.24.2.1.
7. Click Create.

4.3 Horizontal Balances

The Horizontal Balances window contains another main functionalities of the application, generating horizontal energy loss reports. Horizontal energy loss reports are reports on energy loss as energy is transmitted across administrative boundaries. Figure 4.10 shows how the Horizontal Balances window appears in ERT.

Region	Description	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
CENTRAL RIFT	Units Purchased (Gwh)	111.20	103.90	99.60	104.70	102.40	102.30	105.40	99.60	107.70	100.30	104.00	102.30	1,243.40
CENTRAL RIFT	Net Sales(Gwh)	80.70	82.30	79.80	81.60	80.50	78.20	82.50	78.20	82.40	80.40	80.60	82.80	970.00
CENTRAL RIFT	Efficiency(%)	72.57	79.21	80.12	77.94	78.61	76.44	78.27	78.51	76.51	80.16	77.50	80.94	78.01
COAST	Units Purchased (Gwh)	171.30	175.50	174.60	179.20	168.10	174.70	197.10	192.10	188.00	185.00	183.30	175.80	2,164.70
COAST	Net Sales(Gwh)	160.20	154.00	157.00	155.20	149.30	155.00	170.80	158.20	170.70	167.20	163.30	156.70	1,917.60
COAST	Efficiency(%)	93.52	87.75	89.92	86.61	88.82	88.72	86.66	82.35	90.80	90.38	89.09	89.14	88.59
MT KENYA	Units Purchased (Gwh)	70.10	70.90	69.90	70.20	66.20	70.00	72.20	72.00	76.70	71.10	74.70	74.50	858.50
MT KENYA	Net Sales(Gwh)	58.70	56.80	57.40	54.90	53.90	55.30	57.60	56.20	57.10	56.50	57.20	58.00	679.60
MT KENYA	Efficiency(%)	83.74	80.11	82.12	78.21	81.42	79.00	79.78	78.06	74.45	79.47	76.57	77.85	79.16
NAIROBI	Units Purchased (Gwh)	483.10	489.00	475.10	485.60	475.00	459.80	474.10	450.10	481.80	474.00	487.60	482.40	5,717.60
Totals														

Figure 4.13: Horizontal Balances Window

The window is also divided into two sections. These are the selection criteria and report sections. These are labeled 1 and 2 respectively in the image below.

The screenshot shows the Energy Reporting Tool (ERT) interface. At the top, there's a header with the Kenya Power logo and the title 'Energy Reporting Tool (ERT)'. Below the header, the main title 'Horizontal Balances' is displayed. On the left side, there's a vertical sidebar with various icons. The main content area has a red box labeled '1' around the 'Select Period' dropdown, which is set to 'Financial Year FY2023/2024'. Below this, another red box labeled '2' surrounds a table titled 'Monthly Cumulative Regional Purchases (Gwh)'. The table has columns for Region, Description, Jul, Aug, Sep, Oct, Nov, Dec, Jan, Feb, Mar, Apr, May, Jun, and Total. It lists data for regions like CENTRAL RIFT, COAST, and NAIROBI across different descriptions such as Units Purchased (Gwh), Net Sales(Gwh), and Efficiency(%). The table also includes a 'Totals' row at the bottom.

Figure 4.14: Horizontal Balance Sections

The selection criteria only contains one dropdown in which the user selects the financial year. This parameter is used to generate the report shown in the reports section.

The reports section generates three reports. These are:

- Monthly horizontal balances
- Cumulative horizontal balances
- Regional purchases report

4.3.1 Monthly Horizontal Balances

This report contains the monthly horizontal balances for the financial year selected. This is shown in Figure 4.12. It contains two sections.

The first sections shows the horizontal balance for each region. Each region has three entries. The entries are differentiated by their description. The descriptions in the report for each region are:

- Units Purchased (Gwh)
- Net Sales (Gwh)
- Efficiency (%)

The second section contains the totals of the three descriptions for the particular month.

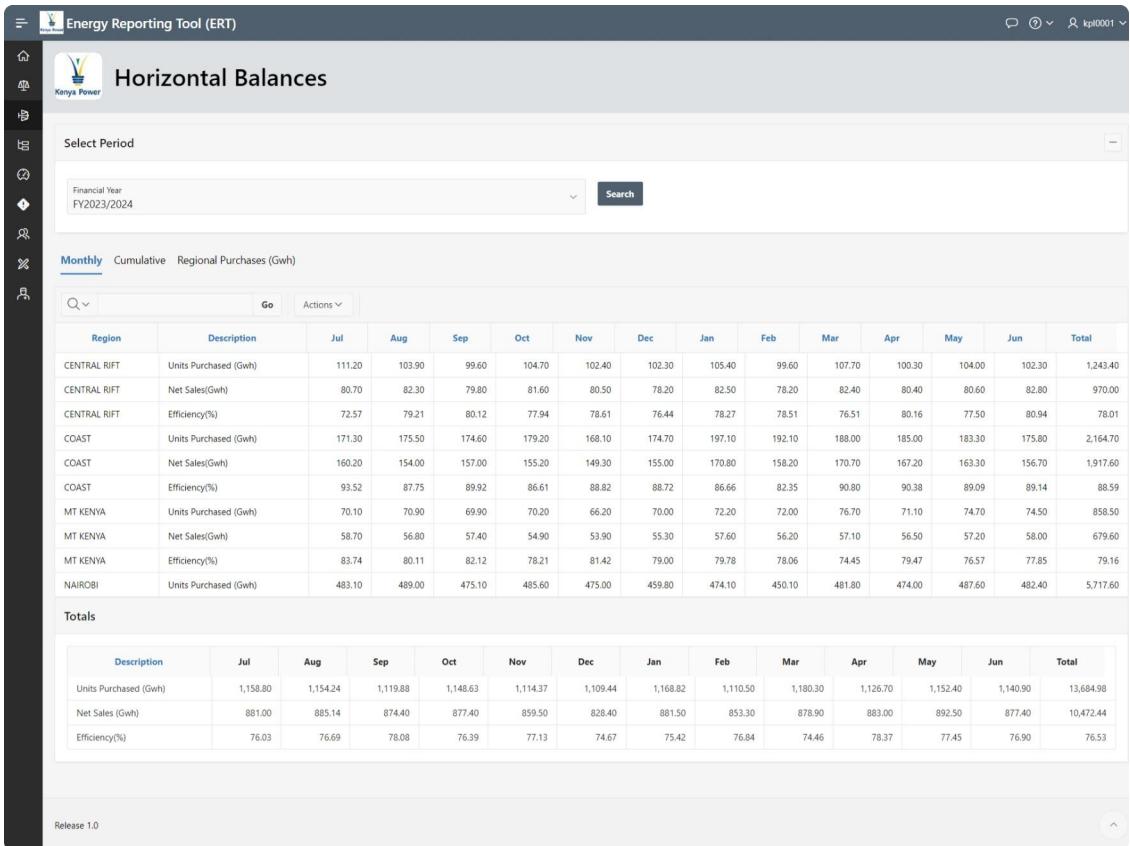


Figure 4.15: Monthly Horizontal Balances Report

4.3.2 Cumulative Horizontal Balances

This report contains the cumulative horizontal balances for the financial year selected. This is shown in Figure 4.13. It is to be noted that the values of the first month shown in the report are the balances for that one month. For the months that follow, the values displayed are a summation of the balances for that month and the months before them.

The screenshot shows the 'Horizontal Balances' report in ERT. The top navigation bar includes the Kenya Power logo and a search bar. The main content area has a title 'Horizontal Balances' and a sub-section 'Select Period' with a dropdown for 'Financial Year' set to 'FY2023/2024'. Below this is a table titled 'Regional Purchases (Gwh)' with columns for Region, Description, and months from July to June. The table lists data for various regions like CENTRAL RIFT, COAST, MT KENYA, and NAIROBI, showing units purchased, net sales, and efficiency percentages. A chart at the bottom shows regional purchases by month.

Region	Description	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
CENTRAL RIFT	Units Purchased (Gwh)	111.20	215.10	314.70	419.40	521.80	624.10	729.50	829.00	936.70	1,037.10	1,141.10	1,243.40
CENTRAL RIFT	Net Sales(Gwh)	80.70	163.10	242.90	324.50	405.00	483.20	565.70	643.90	726.30	806.70	887.20	970.00
CENTRAL RIFT	Efficiency(%)	72.57	75.83	77.18	77.37	77.62	77.42	77.55	77.67	77.54	77.78	77.75	78.01
COAST	Units Purchased (Gwh)	171.30	346.80	521.40	700.60	868.70	1,043.30	1,240.50	1,432.50	1,620.60	1,805.60	1,988.90	2,164.70
COAST	Net Sales(Gwh)	160.20	314.20	471.20	626.40	775.70	930.70	1,101.40	1,259.70	1,430.40	1,597.60	1,760.90	1,917.60
COAST	Efficiency(%)	93.52	90.60	90.37	89.41	89.29	89.21	88.79	87.94	88.26	88.48	88.54	88.59
MT KENYA	Units Purchased (Gwh)	70.10	141.10	211.00	281.30	347.50	417.50	489.70	561.70	638.40	709.50	784.20	858.80
MT KENYA	Net Sales(Gwh)	58.70	115.50	172.90	227.80	281.60	336.90	394.50	450.70	507.80	564.30	621.50	679.50
MT KENYA	Efficiency(%)	83.74	81.86	81.94	80.98	81.04	80.69	80.56	80.24	79.54	79.53	79.25	79.12
NAIROBI	Units Purchased (Gwh)	483.10	972.10	1,447.20	1,932.80	2,407.80	2,867.70	3,341.70	3,791.80	4,273.60	4,747.60	5,235.20	5,717.70

Figure 4.16: Cumulative Horizontal Balances Report

4.3.3 Regional Purchases Report

This report shows the energy purchases done grouped by region. Each region contains a bar for each month of the financial year selected. This is shown in Figure 4.14.

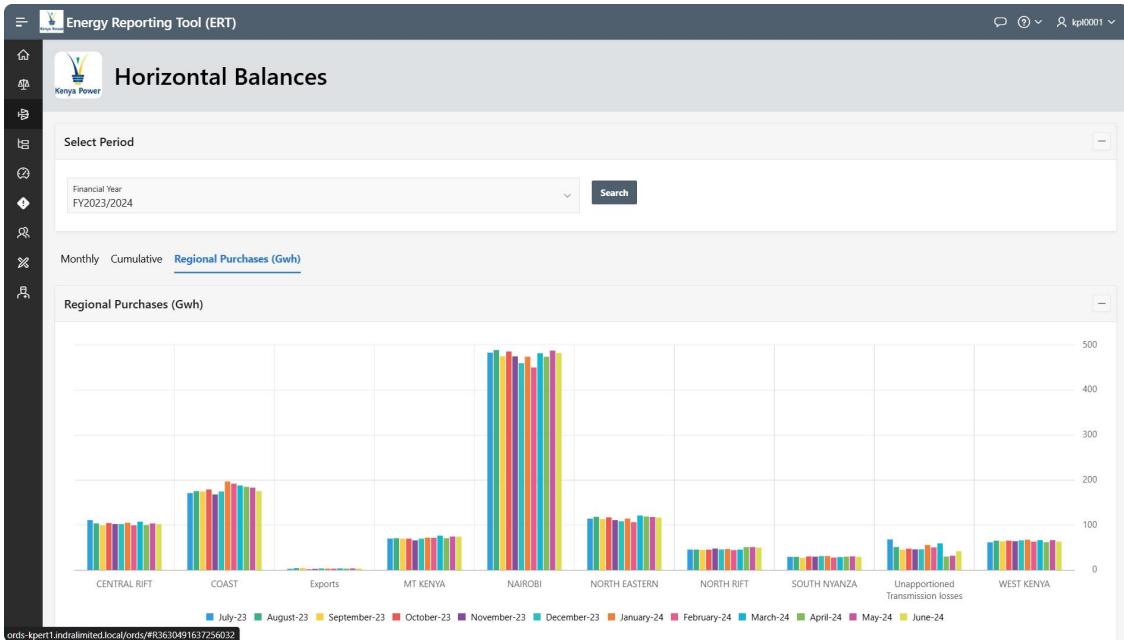


Figure 4.17: Regional Purchases Report

4.4 Network Meter Management

This window enables the user to navigate the entire network tree, view the meters installed in different network elements and the readings for these meters. Figure 4.15 shows how the window looks like in ERT.

The screenshot displays the Network Meter Management window of the Energy Reporting Tool (ERT). The interface includes a sidebar with navigation icons and a top bar with the Kenya Power logo and search functionality.

Network Structure:

- Region: ALL
- County: ALL
- Search: Search

Secondary Substations:

Network Id	Description	Region	County
300606212	21720 - LOWER SIRIKWA FARM W/P	North Rift	Uasin Gishu
300606213	21727 - M. KIPTANUI POULTRY	North Rift	Uasin Gishu
300629751	22566 - PATRICIAN MARKET	North Rift	Uasin Gishu
300629752	22567 - PATRICIAN DISPENSARY	North Rift	Uasin Gishu
300655622	23512B - ELDORET INTERNATIONAL AIRPORT	North Rift	Uasin Gishu

List of Meters:

Meter Number	Network Id	Meter Status	Parent Name	Parent Network Type	Network Name	Kv	Region	County
4002000782	208001730	Active	ELDORET 132/33KV (132 / 33 KV)	TRANS SUBSTATION	AIRPORT EX ELDORET 132/33KV	33	North Rift	Uasin Gishu

Figure 4.18: Network Meter Management Window

The Feeder Meter Management window can be divided into 4 sections. These are:

- Location Search
- Network Tree/Structure
- Network Meters Table
- Meter Readings Table

Figure 4.16 shows the sections numbered respectively.

Select Location

Network Structure (2)

Secondary Substations (3)

List of Meters (4)

Network Id	Description	Region	County
300606212	21720 - LOWER SIRKWA FARM W/P	North Rift	Uasin Gishu
300606213	21727 - M. KIPTANUI POULTRY	North Rift	Uasin Gishu
300629751	22566 - PATRICIAN MARKET	North Rift	Uasin Gishu
300629752	22567 - PATRICIAN DISPENSARY	North Rift	Uasin Gishu
300655622	23512B - ELDORET INTERNATIONAL AIRPORT	North Rift	Uasin Gishu

Meter Number	Network Id	Meter Status	Parent Name	Parent Network Type	Network Name	Kv	Region	County
4002000782	208001730	Active	ELDORET 132/33KV (132 / 33 KV)	TRANS SUBSTATION	AIRPORT EX ELDORET 132/33KV	33	North Rift	Uasin Gishu

Figure 4.19: Network Meter Management Sections

4.4.1 Location Search

This section allows the user to filter the results of the network tree based on the region and county they belong to.

4.4.2 Network Tree/Structure

This section enables the user to browse the energy network from the transmission substations to the primary feeders. The network elements present in the network tree are in the following order:

- Transmission substation
- Transmission feeder
- Primary substation
- Primary feeder

All transmission substations are under one parent, which is named 'Kenya Power'.

Each element in the network tree is represented with a unique icon. These are shown in Figure 4.17 below.

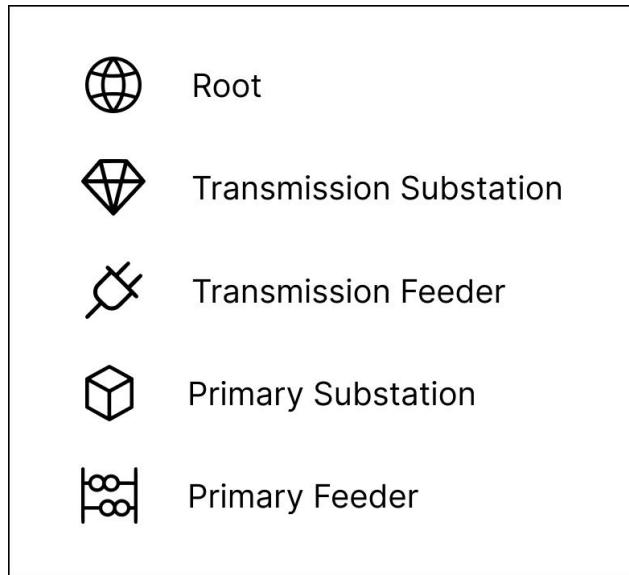


Figure 4.20: Network Tree Icon Key

4.4.3 Secondary Substations

This table contains a list of secondary substations from the selected section of the network tree.

4.4.4 List of Meters

This table contains a list of meters present at the selected section of the network tree.

4.5 Network Meter Reading

The Network Meter Reading window is used to view the meter readings of the network meters. Figure 4.18 show how it appears in ERT.

Meter Search

Region	County	Network Type	Search
ALL	ALL	SEC SUBSTATION	Search

Network Meters

Installation Date	Parent Id	Parent Name	Network Id	Meter Number	Parent Network Type	Network Name	Meter No	Kv
11-JUL-2024	208001428	HARDY EX LANGATA	300001538	14568915	PRI FEEDER	13129 - BOGANI EAST ROAD	14568915	200
11-JUL-2024	208001428	HARDY EX LANGATA	300001532	14568916	PRI FEEDER	13546 - BOGANI EAST ROAD	14568916	315
11-JUL-2024	208001428	HARDY EX LANGATA	300706884	14568918	PRI FEEDER	106612 - 106612	14568918	100
11-JUL-2024	208001428	HARDY EX LANGATA	300001510	14568940	PRI FEEDER	01956 - BROOKE HOUSE SCHOOL	14568940	200
11-JUL-2024	208001428	HARDY EX LANGATA	300001568	14568941	PRI FEEDER	00459 - KISEMBE ESTATE	14568941	100

1 - 5 of 72 >

Meter Readings

Edit	Reading Date	Reading Month	Network Name	Network Id	Meter No	Previous Reading	Current Reading	Consumption
edit	01-JUL-2024	202406	13129 - BOGANI EAST ROAD	300001538	14568915	186,189.28	201,542.74	15,353.46
edit	01-JUN-2024	202405	13129 - BOGANI EAST ROAD	300001538	14568915	170,580.42	186,189.28	15,608.86
edit	01-MAY-2024	202404	13129 - BOGANI EAST ROAD	300001538	14568915	152,252.68	170,580.42	18,327.74
edit	01-APR-2024	202403	13129 - BOGANI EAST ROAD	300001538	14568915	135,349.50	152,252.68	16,903.18
edit	01-MAR-2024	202402	13129 - BOGANI EAST ROAD	300001538	14568915	118,642.72	135,349.50	16,706.78

1 - 5 of 12 >

Release 1.0

Figure 4.21: Network Meter Reading window

The window contains 3 main sections. These are:

- Meter Search
- Network Meter Table
- Meter Readings Table

These sections are marked 1, 2 and 3 respectively in the figure below.

Meter Search

Region	County	Network Type	Search
ALL	ALL	SEC SUBSTATION	Search

Network Meters

Installation Date	Parent Id	Parent Name	Network Id	Meter Number	Parent Network Type	Network Name	Meter No	Kv
11-JUL-2024	208001428	HARDY EX LANGATA	300001538	14568915	PRI FEEDER	13129 - BOGANI EAST ROAD	14568915	200
11-JUL-2024	208001428	HARDY EX LANGATA	300001532	14568916	PRI FEEDER	13546 - BOGANI EAST ROAD	14568916	315
11-JUL-2024	208001428	HARDY EX LANGATA	300706884	14568918	PRI FEEDER	106612 - 106612	14568918	100
11-JUL-2024	208001428	HARDY EX LANGATA	300001510	14568940	PRI FEEDER	01956 - BROOKE HOUSE SCHOOL	14568940	200
11-JUL-2024	208001428	HARDY EX LANGATA	300001568	14568941	PRI FEEDER	00459 - KISEMBE ESTATE	14568941	100

Meter Readings

Edit	Reading Date	Reading Month	Network Name	Network Id	Meter No	Previous Reading	Current Reading	Consumption
	01-JUL-2024	202406	13129 - BOGANI EAST ROAD	300001538	14568915	186,189.28	201,542.74	15,353.46
	01-JUN-2024	202405	13129 - BOGANI EAST ROAD	300001538	14568915	170,580.42	186,189.28	15,608.86
	01-MAY-2024	202404	13129 - BOGANI EAST ROAD	300001538	14568915	152,252.68	170,580.42	18,327.74
	01-APR-2024	202403	13129 - BOGANI EAST ROAD	300001538	14568915	135,349.50	152,252.68	16,903.18
	01-MAR-2024	202402	13129 - BOGANI EAST ROAD	300001538	14568915	118,642.72	135,349.50	16,706.78

Figure 4.22: Network Meter Reading Sections

The Meter Search section enables the user to search for a meter based on region, county and network type. The Network Meter Table contains all the network meters present in an area based on the criteria set in the Meter Search. The Meter Readings Table contains the readings of a selected meter from the list of meters in the Network Meter Table. Each record in the Meter Readings Table contains an edit button on the left under the 'Edit' column. This enables the user to edit the existing reading.

On clicking the edit button, a modal appears as shown in the figure below. The modal has two tabs including Modification History and Edit Meter Reading. The Modification History tab contains a history of the modification of a meter reading. The Edit Meter Reading tab contains a form that allows the user to edit a meter reading. This is shown in Figure 4.24.

Consumption	
201,542.74	15,353.46
186,189.28	15,608.86
170,580.42	18,327.74
152,252.68	16,903.18
135,349.50	16,706.78

1 - 10 of 12

Figure 4.23: Meter Reading Information Modal

Consumption	
201,542.74	15,353.46
186,189.28	15,608.86
170,580.42	18,327.74
152,252.68	16,903.18
135,349.50	16,706.78
118,642.72	16,726.36
101,916.36	17,322.18
84,594.18	18,737.10
65,857.08	18,933.16
46,923.92	15,947.40
30,976.52	15,698.12
15,278.40	15,278.40

1 - 10 of 12

Figure 4.24: Edit Meter Reading Tab in Meter Reading Information Modal

4.5.1 Processes

The processes that can be carried out in the Network Meter Reading window including searching for a meter and editing a reading.

4.5.1.1 Searching for a meter

To search for a meter, follow the following steps:

1. Select a region from the region dropdown. This narrows the search to a specific region. If the 'All' option is selected, all meters in the network tree will be displayed.
2. Select a county from the county dropdown. This narrows the search to a specific county within the selected region. If the 'All' option is selected, all meters in the selected region will be shown. If the region was also set to 'All', all meters in the network tree will be displayed.
3. Selected the network element in which the meter is located in.
4. Click search.

4.5.1.2 Editing a meter reading

To edit a meter reading, follow the following steps:

1. Click the edit icon on the left of any record in the Meter Readings table. The icon is under the 'Edit' column.
2. Select the Edit Meter Reading tab.
3. From here, you can modify the previous reading and the current reading. You can also modify the reading date and the reading month.

4.6 Exceptional Report

The exceptional report contains a couple of reports important to ERT as their information affect the reports generated by the application. These reports include the following:

- Meters on Feeders that not in FDB
- Large Power Customers
- Elements on Unknown Location
- Feeder without Meters

On opening the window, a user is met by a dropdown in which they choose which report to generate. This is seen in Figure 4.20.

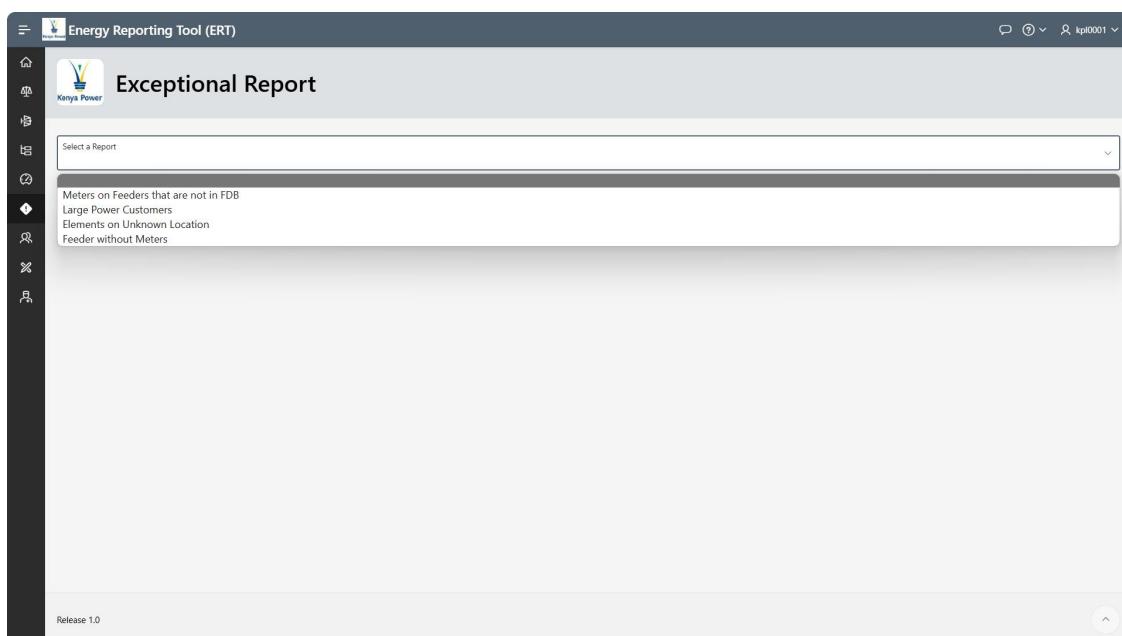


Figure 4.25: Exceptional Report Window

4.6.1 Meters on Feeders that not in FDB

This report contains all the meters that are attached to feeders but the feeders do not currently exist in FDB. The report appears as shown in the image below.

Region	County	Meter No	Feeder ID	Feeder Name	KV
Coast	Kilifi	11900069281	NOT IN FDB	KAFUNDUNI 11 KV EX KOKOTONI	11
Coast	Kilifi	11900069283	NOT IN FDB	KASEMENI 11 KV EX KOKOTONI	11
Coast	Kilifi	11900069278	NOT IN FDB	MARIAKANI 11 KV EX KOKOTONI	11
Coast	Kilifi	11900069280	NOT IN FDB	MAZZERAS 11 KV EX KOKOTONI	11
Coast	Kilifi	Not Metered	NOT IN FDB	MRM EX MARIAKANI	11
Coast	Kilifi	4002000684	NOT IN FDB	BAMBA 33KV EX MARIAKANI	33
Coast	Mombasa	40013031578	NOT IN FDB	KIMATHI 2 11KV EX MBARAKI	11
Coast	Mombasa	Not Metered	NOT IN FDB	GRAINBULK 2 11KV EX MAKANDE	33
Coast	Mombasa	4002000204	NOT IN FDB	KITUI 11KV EX MAKANDE	33
Nairobi	Nairobi North	4002000090	NOT IN FDB	BARCLAYS PLAZA	11
Nairobi	Nairobi North	4002000241	NOT IN FDB	CITY HALL EX CATHEDRAL	11
Nairobi	Nairobi North	4002000243	NOT IN FDB	JEEVANIE EX CATHEDRAL	11
Nairobi	Nairobi West	Not Metered	NOT IN FDB	ICOLO EX LANGATA	11
North Eastern	Wajir	Not Metered	NOT IN FDB	KOTULO FDR	33
South Nyanza	Nyamira	Not Metered	NOT IN FDB	MOGENI 11KV EX IKONGE	11

Figure 4.26: Meters on Feeders that are not in FDB Report

4.6.2 Large Power Customers

This reports contains a list of all the large power customers in KPLC. Large power customers consume more energy than the normal customer. In KPLC, the cumulative energy consumed by large power customers is over half the energy produced by KPLC. This means that a failure in billing of one or more of the customers results to great changes in the energy loss reports generated. The report appears as shown in the image below.

Account Number	Full Name	Status	Reading Date	Reading Month	Consumption	Avg 6months	Deviation	%deviation
160212052	KHETIA DRAPERS LIMITED	Active	06/04/2024	202402	0			
160212052	KHETIA DRAPERS LIMITED	Active	06/04/2024	202402	0			
143815371	MULTI AGENCY THIYZARA LIMITED	Active	02/04/2024	202402	98			
143815371	MULTI AGENCY THIYZARA LIMITED	Active	02/04/2024	202402	98			
151325149	EPHRAIM MUCHIRI NJOROGE	Active	01/04/2024	202402	0			
148284474	EXPRESS KITCHEN LIMITED	Active	01/04/2024	202402	12,064			
12216477	CATHOLIC DIOCESE OF NAKURU	Suspended	01/04/2024	202402	6,746			
151325149	EPHRAIM MUCHIRI NJOROGE	Active	01/04/2024	202402	0			
148284474	EXPRESS KITCHEN LIMITED	Active	01/04/2024	202402	12,064			
161685581	GOLD CROWN FOODS EPZ LIMITED	Active	01/04/2024	202402	16,340			
155121049	HENAN HIGHWAY ENGINEERING GROUP	Active	01/04/2024	202402	4,466			
157606011	JUMLOT COMPANY LIMITED	Active	01/04/2024	202402	17,496			
154168165	KINGSTONE CONCRETE QUARRY LIMITED	Active	01/04/2024	202402	27,014			
154830838	MUKTI LIMITED	Active	01/04/2024	202402	40,792			
151168931	MATHEW MBURU MBUGUA	Active	01/04/2024	202402	3,540			
141738278	MENENGAI OIL REFINERIES LIMITED	Suspended	01/04/2024	202402	202			
160076929	MERU CENTRAL DAIRY CO-OP UNION	Active	01/04/2024	202402	52			

Figure 4.27: Large Power Customers Report

The report window appears differently from other reports. It contains a month dropdown that allows the user to select the month for which they want to view the readings.

4.6.3 Elements on Unknown Location

This report contains a list of network elements whose location is not known. The network elements exist in the database but their location is not present. This report appears as shown in the image below.

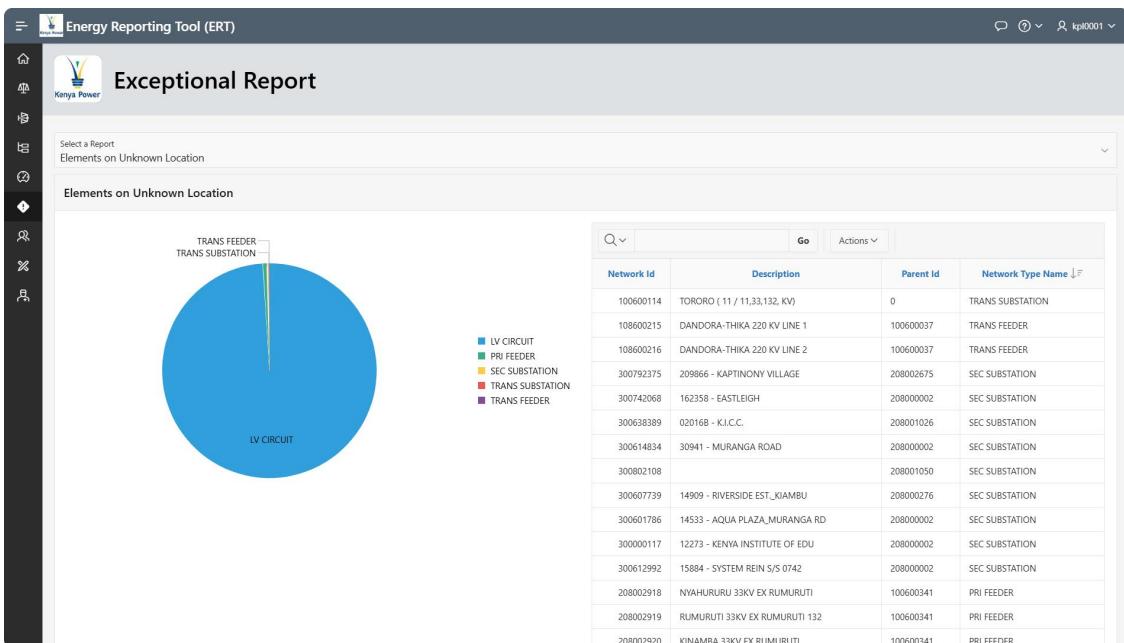


Figure 4.28: Elements in Unknown Location Report

The pie chart legend in the interactive. On clicking on any of the items in the legend, you can remove it from the pie chart. This re-renders the pie chart to display without the selected element. The image below shows the pie chart with LV Circuit deselected.

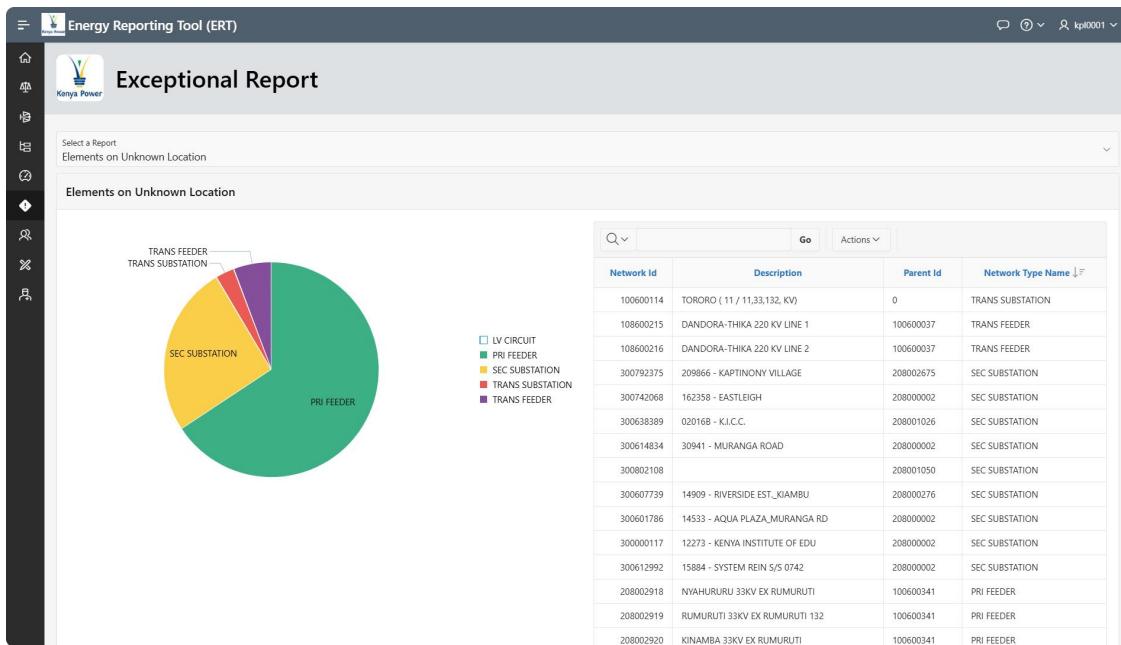


Figure 4.29: Elements on Unknown Location - Pie chart modified

4.6.4 Feeder without Meters

This report contains a list of feeders that do not have meters attached to them. This is shown in the image below.

Network Id	Network Name	Kv	County	Region
208002930	CHEMBULET EX MOIBEN 33/11KV	11	Unknown	Unknown
208002929	KAPSILOT EX MOIBEN 33/11KV	11	Unknown	Unknown
208002928	MOIBEN EX MOIBEN 33/11KV	11	Unknown	Unknown
208002922	ORTUM 33KV	33	Unknown	Unknown
208002925	KWANZA EX ENDEBESS 33/11KV	11	Unknown	Unknown
208002926	SUAM EX ENDEBESS 33/11KV	11	Unknown	Unknown
208000315	UNION TOWER	11	Nairobi North	Nairobi
208001055	ANNIVERSARY TOWER	11	Nairobi North	Nairobi
208000187	HILTON	11	Nairobi North	Nairobi
208000202	KIMATHI HOUSE	11	Nairobi North	Nairobi
208000192	KIRINYAGA RD	11	Nairobi North	Nairobi
208001782	PARKLANDS NO. 2	11	Nairobi North	Nairobi
208000197	RUPSON	11	Nairobi North	Nairobi
208000184	STANBANK	11	Nairobi North	Nairobi
20800018	STATE HOUSE ROAD	11	Nairobi North	Nairobi
208000336	LILIAN TOWERS	11	Nairobi North	Nairobi
208002694	LOITOKTOK 33 KV EX LOITOKTOK	33	Kajiado	Nairobi

Figure 4.30: Feeder without Meters

4.7 User Management

The User Management window is used to manage the users in the system. It enables a user to create, view and modify users and their assigned profile. The window look as shown in Figure 4.26.

	Staff No	First Name	Other Names	Email Address	Profile	Status	Password Action
<input type="checkbox"/>	gokoth	Gadi	Okoth Odongo	gokoth@indracompany.com	Administrator	ACTIVE	
<input type="checkbox"/>	kpl001	Tester	Testing	tester@gmail.com	Administrator	ACTIVE	
<input type="checkbox"/>	kpl002	Chege	Wa Maina	wmaina@gmail.com	Administrator	ACTIVE	
<input type="checkbox"/>	ert	ERT	ADMIN	ert@indracompany.com	Query	ACTIVE	
<input type="checkbox"/>	gnyakiamo	Gregory	Nyakiamo	gnyakiamo@indracompany.com	Query	ACTIVE	

Figure 4.31: User Management Window

On clicking the 'Create User' button, a modal is opened that enable the user to create a new system user. The modal opened is shown in the image below.

System User Form

Staff Number

First Name

Other Names

Email Address

Profile <ALL>

Status Active

Create

Figure 4.32: Create User Modal in User Management Window

The button on the left of every record is used to modify the details of the user. The button looks similar to the image shown below.



Figure 4.33: Edit Profile Button

On clicking it, a modal is opened which enables the user to edit the details of an existing user. The modal opened appears as shown below.

The screenshot shows the 'User Management' screen of the Energy Reporting Tool (ERT). On the left, there is a sidebar with various icons. The main area displays a table of users with columns for 'Staff No' and 'First Name'. A modal window titled 'System User Form' is open over the table, containing fields for 'Staff Number' (kpl0001), 'First Name' (Tester), 'Other Names' (Testing), 'Email Address' (tester@gmail.com), 'Profile' (Administrator), and 'Status' (Active). At the bottom of the modal are 'Cancel', 'Delete', and 'Apply Changes' buttons. To the right of the modal, there is a table titled 'Password Action' with columns for 'Status' and 'Password Action'. All entries in this table show 'ACTIVE' status and a pencil icon in the 'Password Action' column. The bottom right corner of the modal shows '1 - 5'.

Figure 4.34: Edit User Details Modal in User Management Window

The button on the right of every record, under the column name ‘Password Action’, is opens a modal that enables the user to edit a user’s password including their own. The modal appears as shown in the image below.

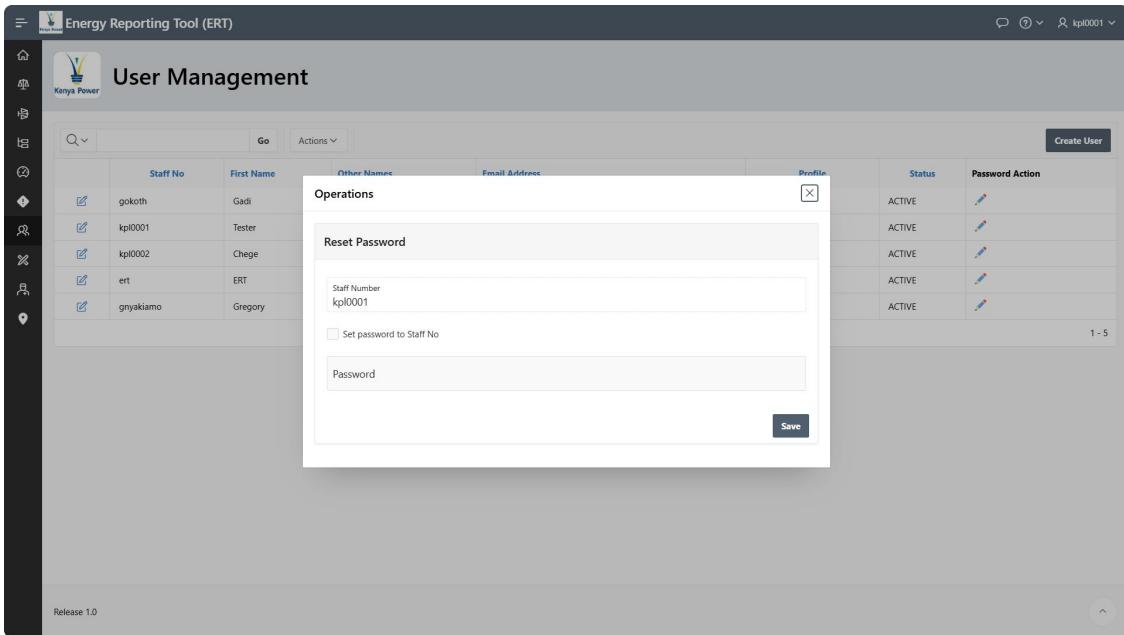


Figure 4.35: Change User Password Modal in User Management Window

4.7.1 Processes

The processes that can be carried out in the User Management Window include creating a user, editing a user, deleting a user and changing a user's password. These are described below.

4.7.1.1 Creating a user

To create a user, follow the following steps:

1. Click the 'Create User' button. This opens up a modal with a form to enter the new user's information.
2. Enter their staff number.
3. Enter their first name.
4. Enter their other name.
5. Enter their email address.
6. Select a profile from the dropdown. The profile selected will determine the level of access of the user within the system.
7. Select the status of the new user. The status indicates whether the created user will be active or inactive within the system. If a user's status is set to inactive, they are not able to log into the system.
8. Click the 'Create' button at the bottom right of the modal to create the user.

4.7.1.2 Editing a user

To edit a user, follow the following steps:

1. Click the button on the left most side of any record. The button should look like similar to Figure 4.33. A modal will open up containing the current details of the user.
2. Edit any of the user details.
3. Click 'Apply Changes' at the bottom right of the modal to save your changes.

4.7.1.3 Deleting a user

To delete a user, follow the following steps:

1. Click the button on the left most side of any record. The button should look similar to Figure 4.33. A modal will open up containing the current details of the user.
2. Click the 'Delete' button at the bottom left side of the modal. It should be right next to the 'Cancel' button.
3. On clicking the Delete button, a dialog will pop up asking you to confirm your action. Click the red 'Delete' button in the dialog to complete your action.

4.7.1.4 Changing a user's password

To change a user's password, follow the following steps:

1. Click the button to the right of any record. The button should be under the 'Password Action' column. A modal will open up showing the selected user's staff number.
2. Enter the new password in the password field. You also have the option of directly setting the user's staff number as their password through the checkbox above the password field.
3. Click the 'Save' button at the bottom right of the modal to persist your changes.

4.8 System Parameters

The System Parameters window is used to manage various values used in the system. Each value has a group it belongs to and a unique ID known as the Type Id. The window appears as shown in Figure 4.27.

Type Group	Type Id	Description	Num Act
CALCULATION_TYPE	CT001	Monthly	1
CALCULATION_TYPE	CT002	Cycle	2
CALCULATION_TYPE	CT003	Prorated	3
CONSUMPTION_TYPE	CONS01	POSTPAID	1
CONSUMPTION_TYPE	CONS02	PREPAID	2
EXCEPTIONAL_REPORT	RP004	Elements on Unknown Location	4
EXCEPTIONAL_REPORT	RP002	Large Power Customers	2
EXCEPTIONAL_REPORT	RP001	Meters on Feeders that are not in FDB	1
EXCEPTIONAL_REPORT	RP003	Feeder without Meters	3
EXECUTION_STATUS	EXS002	Running	2
EXECUTION_STATUS	EXS004	Cancelled	4
EXECUTION_STATUS	EXS003	Completed	3
EXECUTION_STATUS	EXS001	Pending	1
GPR	GPR003	0%	3
GPR	GPR002	BELOW 0%	2
GPR	GPR001	Unmetered Feeders	1
GPR	GPR004	1% TO 50%	4
GPR	GPR006	100%	6
GPR	GPR005	46% TO 99%	5

Figure 4.36: System Parameters Window

The 'Create' button opens a form from the right that allows the user to create a parameter. This is shown in the image below.

The screenshot shows the 'System Parameters' window in the Energy Reporting Tool (ERT). On the left, there's a sidebar with icons for home, search, refresh, and other system functions. The main area has a title 'System Parameters' and a table with columns: Type Group, Type Id, and Description. The table lists various parameters like CALCULATION_TYPE, CONSUMPTION_TYPE, and EXECUTION_STATUS. An edit icon is visible next to each row. To the right, a modal dialog titled 'Params Form' is open, containing fields for Type Group (set to CALCULATION_TYPE), Type ID (set to CT003), and Description (set to Prorated Period). There are also buttons for Cancel and Create.

Figure 4.37: Create Parameter Form in System Parameter Window

On clicking on any edit button to the left of each record in the table, a similar form opens from the right, enabling the user to edit the attributes of the existing system parameter. The edit button should look similar to Figure 4.33. The form displayed looks as shown below.

This screenshot is identical to Figure 4.37, showing the 'System Parameters' window and the 'Params Form' dialog. The 'Params Form' dialog now shows the edited values: Type Group set to CALCULATION_TYPE, Type ID set to CT003, and Description set to Prorated Period. The 'Apply Changes' button is visible at the bottom right of the dialog.

Figure 4.38: Edit Parameter Form in System Parameters Window

4.8.1 Processes

The process that can be carried out in the System Parameters Window including creating, editing and deleting a system parameter. These are described below.

4.8.1.1 Creating a System Parameter

To create system parameter, follow the following steps:

1. Click the 'Create' button on the top right side of the System Parameters window. A form should appear from the right.
2. Enter the Type Group for the new parameter.
3. Enter the Type ID.
4. Enter the Description.
5. Enter the Num Act. This is used to differentiate between different parameters in a similar type group numerically.
6. Click the 'Create' button at the bottom right of the form to save the new system parameter.

4.8.1.2 Editing a System Parameter

To edit a system parameter, follow the following steps:

1. Click the edit button to the left of any system parameter. The button should similar to Figure 4.33. This will open a form similar to the one for creating a system parameter, from the right side of the screen.
2. Modify any of the attributes.
3. Once done, click the 'Apply Changes' button at the bottom right of the form to save your changes.

4.8.1.3 Deleting a system parameter:

To delete a system parameter, follow the following steps:

1. Click the edit button to the left of any system parameter. The button should similar to Figure 4.33. This will open a form similar to the one for creating a system parameter, from the right side of the screen.
2. Click the 'Delete' button at the bottom left side of the form. The button should be to the right of the 'Cancel' button.
3. On clicking the Delete button, a dialog will pop up asking you to confirm your action. Click the red 'Delete' button in the dialog to complete your action.

4.9 Manage Profiles

The Manage Profiles window is used to manage the profile assigned to users in the system. The profile contain permissions that determine what windows a user can see and what actions they can carry out within the system. Each profile has a unique name which identifies it. The window appears as shown in Figure 4.28.

The screenshot shows the 'Manage Profiles' window of the Energy Reporting Tool (ERT). The left sidebar contains icons for Home, System, Reports, and User Management. The main area has a title bar 'Manage Profiles' and a search bar 'Search...'. A table lists various profiles, each with a count and a 'View' link. The profiles are categorized into 'Query' and 'Administrator' sections.

Category	Profile	Count	
Query	ACCESS_FEEDER_METER_MANAGEMENT	2 >	
	ACCESS_EXCEPTIONAL_REPORT	2 >	
	ACCESS_ENERGY_BALANCES	2 >	
	ACCESS_METER_READINGS	2 >	
	Administrator		
	ACCESS_METER_READINGS	1 >	
	ACCESS_SYSTEM_PARAMETERS	1 >	
	ACCESS_SYSTEM_USERS	1 >	
	EDIT_METER_READING	1 >	
	REQUEST_METER_INSTALLATION	1 >	
SCHEDULE_EXECUTION	1 >		
ACCESS_MANAGE_PROFILES	1 >		
ACCESS_FEEDER_METER_MANAGEMENT	1 >		
ACCESS_EXCEPTIONAL_REPORT	1 >		
ACCESS_ADMINISTRATION	1 >		

Figure 4.39: Manage Profiles Window

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