

WHEELING FRAMEWORK & TARIFF METHODOLOGY FOR OPEN ACCESS IN THE ELECTRICITY GRID IN KENYA



Energy & Petroleum Regulatory Authority

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LIST OF ACRONYMS AND ABBREVIATIONS

AMA	Actual Monthly Availability
CT	Current Transformer
CAIDI	Customer Average Interruption Duration Index
EKT	Ethiopia–Kenya–Tanzania
EPRA	Energy and Petroleum Regulatory Authority
ESG	Environmental, Social and Governance
GA	Guaranteed Availability
HVDC	High-Voltage Direct Current
IEC	International Electrotechnical Commission
KEBS	Kenya Bureau of Standards
KETRACO	Kenya Electricity Transmission Company Limited
KPLC	Kenya Power and Lighting Company PLC
kV	Kilovolt
kVArh	Kilovolt-Ampere Reactive Hour
kWh	Kilowatt-hour
LRMC	Long-Run Marginal Cost
MVA	Megavolt-Ampere
MW	Megawatt
MWh	Megawatt-hour
NSP	Network Service Provider
O&M	Operations and Maintenance
OPEX	Operating Expenditure
PPA	Power Purchase Agreement
ROE	Return on Equity
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
T&D	Transmission and Distribution
VT	Voltage Transformer
WSA	Wheeling Service Asset

DEFINITIONS

Buyer-Means a party in the Wheeling Agreement responsible for receiving energy/power at the Withdrawal Point

Seller-Means a party to the Wheeling Agreement responsible for generating or injecting power to the grid at the Injection Point.

Parties-Means entity or persons signing a Wheeling Agreement, and includes the entity generating the power, the entity buying the power and the respective Network Service Provider

Transmission Service Provider –means a Licensee operating Transmission Network of 132kV and above, currently designed as KETRACO

Distribution Service Provider- means a Licensee operating Distribution Network of voltage upto 66kV and above, currently designed as KPLC

Network Service Provider- means Distribution or Transmission licensee, owning or operating distribution or transmission network respectively

Distribution Network- Means network line and associated sub-station with voltage up to 66KV

Transmission Network- Means network line and associated sub-station with voltage of 132KV

Wheeling Service Assets- Means distribution or transmission assets providing a regulated business of distribution and transmission of electricity.

Withdrawal point - Means the metered point at which wheeled electrical energy is received from the transmission or distribution network by the Buyer under a Wheeling Agreement.

Actual Monthly Availability- Means the percentage of time during a month that the relevant network is capable of transmitting or distributing the contracted capacity in accordance with the Wheeling Agreement.

Wheeler - means the person using the transmission system or distribution system of a transmission licensee or distribution licensee, as the case may be, for the conveyance of electricity on payment of wheeling charges.

Injection point - Means the metered point at which electrical energy is delivered into the Transmission or Distribution network under a Wheeling Agreement.

Guaranteed Availability - Means the minimum contractual network availability that the Network Service Provider is required to maintain during the applicable billing period.

Curtailment - Means the reduction or restriction of scheduled electrical energy injection or withdrawal resulting from network constraints, system security requirements, planned outages or instructions issued by the System Operator.

1. INTRODUCTION

1.1 Background

The **Energy Act Cap. 314,** establishes the legal framework for the generation, transmission, distribution, supply, and use of electrical energy and empowers the **Energy and Petroleum Regulatory Authority (EPRA)** to regulate the electricity subsector with a comprehensive legal framework for the generation, transmission, distribution, supply, and use of electrical energy, while facilitating private sector participation and investment.

Pursuant to the Energy Act Cap. 314, the electricity sector is transitioning towards a more competitive market structure that permits greater participation by generators, suppliers, distributors, traders, and consumers. The Energy Act Cap. 314 contemplates licensing of multiple electricity market participants engaged in generation, transmission, distribution, retail supply, importation, exportation, and bulk supply of electrical energy.

Open Access and Wheeling are market mechanisms that enable licensed entities to utilize existing transmission and distribution networks to transport electrical energy from a generating source to a designated consumer or supplier subject to payment of regulated network charges.

1.2 Statement of the Framework

This Framework establishes the regulatory, commercial, and technical arrangements governing third-party access to electricity networks in Kenya. The Open Access and Electricity Wheeling Framework shall provide transparent, fair, non-discriminatory and cost-reflective access to electricity transmission and distribution networks in Kenya, promote competition and consumer choice, ensure recovery of prudent network costs, safeguard system reliability, and support sustainable development of the electricity sector in accordance with the Energy Act, Cap. 314.

1.3 Legal Basis

This Framework is issued pursuant to:

- Section 10 of the Energy Act Cap. 314, which mandates EPRA to regulate generation, importation, exportation, transmission, distribution, supply, and use of electrical energy.

- Part VI of the Energy Act Cap. 314 governing the electricity subsector.
- EPRA's statutory mandate to determine, review and approve tariffs, charges and licensing conditions relating to electricity services.
- The licensing framework established under the **Energy (Electric Power Undertaking Licensing) Regulations, 2024**.

1.4 Objective

The objectives of the Framework are to:

a) Facilitate non-discriminatory access to transmission and distribution systems;

b) Promote competition and consumer choice in electricity supply;

c) Enable direct sales of electricity between generators and eligible consumers;

d) Promote cost-reflective network pricing;

e) Encourage efficient utilization of transmission and distribution infrastructure;

f) Support integration of renewable energy resources;

g) Provide certainty to investors and market participants; and

h) Maintain system reliability, quality, safety and security.

1.5 Applicable Legislative and Regulatory Framework

This Framework shall be read together with the following laws, regulations, codes and standards

1.5.1 Primary Legislation

The key primary legislation include:

a) The Constitution of Kenya, 2010;

b) Energy Act Cap. 314;

c) National Energy Policy 2025 - 2034

d) Competition Act, Cap. 504

1.5.2 Subsidiary Legislation

The key subsidiary legislation include:

i. **The Energy (Electricity Market, Bulk Supply and Open Access) Regulations, 2026** which operationalizes Kenya's transition from a vertically integrated electricity supply model to a more competitive and accessible electricity market as envisioned under the Energy Act, Cap. 314. Particularly, the Regulations provide a framework for the establishment of a competitive electricity market with customer choice, third-party access to networks, bulk power trading and wheeling tariff development in Kenya;

ii. **The Draft Energy (System Operations) Regulations, 2025** which provides for efficient, safe, reliable, and coordinated system operations of the Kenya National Transmission System and Interconnected Transmission System.

iii. **The Energy (Reliability and Quality of Electrical Energy Supply and Service) Regulations, 2021** which establishes a regulatory framework for monitoring, measuring, and enforcing reliability of supply, quality of electrical energy supply, and quality of service by Licensees, through prescribed performance standards, reporting requirements, compliance monitoring procedures, and enforcement mechanisms aimed at protecting consumers and improving service delivery in Kenya's electricity sector.

iv. **The Energy (Complaints and Disputes Resolution) Regulations, 2012** which establish a comprehensive and transparent mechanism for the lodging, investigation, mediation, determination, and enforcement of complaints and disputes arising within the energy sector, thereby protecting consumer rights, promoting accountability among licensees, ensuring compliance with the Energy Act Cap. 314 and facilitating fair, efficient, and timely resolution of disputes between stakeholders.

v. **The Energy (Electricity Licensing) Regulations, 2012** which establish a transparent and comprehensive licensing framework governing the generation, transmission, distribution, and supply of electrical energy in Kenya; prescribe the requirements and procedures for obtaining and maintaining licenses and permits; promote safety, reliability, efficiency, and compliance with sector standards;

protect consumers and the public interest; and facilitate sustainable investment and development of the electricity sector.

vi. **The Draft Energy (Regulatory Accounts) Regulations, 2026 and The Energy (Tariff) Regulations, 2026** provide a framework for addressing financial sustainability of licensees, operational and organizational independence, transparency and cost reflectivity in the calculation and determination of tariffs.

vii. The Energy (Incident and Accidents Reporting) Regulations, 2026

These regulations aim to provide regulatory framework for reporting, notification, investigation and follow-up of electrical incidents and accidents, and facilitate enforcement of safety and compliance requirements.

1.5.3 Industry Codes and Standards

- **Kenya National Transmission Grid Code (2024)** which establishes the technical and operational rules governing the national Transmission Network. It ensures that electricity generated across the country is transmitted safely, reliably, and efficiently through the high-voltage grid.
- **Kenya National Distribution Grid Code (2024)** regulates the planning, operation, maintenance, and development of Distribution Networks that deliver electricity from substations to end users.
- **Applicable International Electrotechnical Commission (IEC) Standards**

1.6 Application of the Framework

This Framework shall apply to all Open Access and wheeling transactions involving the use of licensed transmission or distribution systems in Kenya.

Specifically, it shall apply to generation, transmission, distribution, retail supply, sale of electrical energy and provision of system ancillary services modelled into:

- Generator-to-Consumer Transactions
- Energy Wheeling
- Supplier and Trader Transactions
- Industrial and Commercial Consumers

- Bulk Supply Transactions
- Future Competitive Electricity Market Arrangements

Open Access and wheeling transactions involving international or regional parties of energy/power imported into the country shall have the option to enter into agreements with terms that are agreed upon by the parties outside this framework. This shall facilitate regional and international trade.

1.7 Goal of the Framework

The Framework is expected to deliver the following regulatory and economic benefits:

5.1 Increased consumer choice: Eligible consumers can select electricity suppliers based on price, service quality, reliability, and sustainability objectives.

5.2 Lower cost of electricity: Direct contractual arrangements between generators and consumers may reduce procurement costs by promoting competition and reducing transaction inefficiencies.

5.3 Efficient network utilization: Open access improves utilization of existing transmission and distribution assets and reduces underutilization of network infrastructure.

5.4 Attraction of private investment: The Framework creates opportunities for investment

5.5 Enhanced renewable energy procurement: Corporate consumers can procure electricity directly from renewable generators, supporting ESG and decarbonization commitments.

5.6 Improved industrial competitiveness: Provides industries with greater flexibility in managing energy costs and securing long-term electricity contracts.

5.7 Revenue certainty for network operators: Transmission and Distribution licensees continue recovering prudent costs through approved wheeling tariffs and network use-of-system charges.

5.8 Regional market integration: Supports Kenya's participation within the East African Power Pool and regional electricity trade initiatives.

2. METHODOLOGY & TARIFF

2.1 Current Framework

The retail tariff that governs electricity pricing in the country aggregates cost segments across the value chain, from generation, transmission, distribution and retail. The tariff output is a cost/kWh, which is further desegregated into pricing based on voltage levels in the transmission and distribution system.

The pricing framework is based on average cost of provision of transmission and distribution services, including cost segments covering administration, customer service/commercials, network management, retail/billing, depreciations, and associated overheads. The recovery of these costs is spread across customers, with customers paying similar costs irrespective of their location node on the grid.

The goal of open access on the electricity grid is to promote optimal usage of the network without discrimination on the basis of ownership, with customers paying for the portion of the cost they cause on the network.

2.2 Methodology & Options

The market for provision of transmission services and the attendant wheeling tariff has various methodologies and design depending on the nature of the network, technology and skills in modelling the network.

The Tariff Calculation of the Ethiopia-Kenya-Tanzania (EKT) transaction (Final Methodology Report) identified the process perspective of designing a wheeling tariff, with emphasis on the following key fundamental key areas;

a) Identification of Wheeling Service Assets- involves decision rule of nature and types of assets identified on the network that are categorized as wheeling service assets. In a flow base methodology, these assets would be defined as the primary circuit and all secondary circuits affected by at least 1% of the total flows in the grid. The Postage Stamp methodology would list the entire network assets, irrespective of the node of the injection and withdrawal. The assets identified for this framework include all Transmission and Distribution lines, including the substations, the Right of Use Assets/Wayleave rights, National Control Center etc.

b) Valuation of the Wheeling Service Assets- involves determination and assignment of monetary value to the Wheeling Service Assets. The various valuation methods considered include Standard Costs (which uses industry estimate, which is an averaged estimated value based of similar projects), Net Book Value (looks at the Assets and their carrying depreciated value in the Network Service Provider books of account), Fair Value (Estimate and assign the market carrying value based on what the Asset would sale for in a competitive market).

c) Estimation of Operating Expenditure- the framework utilizes O&M costs relating to repair and maintenance of the Wheeling Service Asset identified. This excludes items like credit losses, impairment, administration costs, retailing/customer services, staff welfare. It includes Salaries & Wages for O&M team, transport, security, insurance, repairs/overhauls, Right of Way clearance, National Control Center costs, depreciation charge for the Wheeling Service Assets and amortization of Right of Use assets like wayleaves and other intangible assets.
The Opex is adjusted for revenues received from customers as capital contributions and similar revenues like fiber optic leases, to derive net operating expenses, which is what is utilized.

2.3 Revenue Requirement & Allocation

The Revenue Requirement (RR_t)represents the incremental annual cost of operating and maintaining the network and its associated nodes, plus the proportionate return and the applicable taxes.

$RR_t = \sum_{i=1}^{n} D_{it} + ROE_{it} + OPEX_t + T_t$ for an n-identified Wheeling Service Assets (WSA), and where D_{it} is the depreciation charge for WSA i, and T_t being the applicable tax on the allowed Return on Equity (ROE)

Consideration given for the framework is an ROE of 12.5% and corporate tax rate of 30%.

The allocation options considered included the various that underpin determination of wheeling tariffs across various jurisdictions and entails allocation of the calculated RR_t among the network users, on a non-discriminatory framework, based on their energy

(MWh), Power Capacity (MW) they are abstracting from the grid. Some of the allocation frameworks include;

a) Postage Stamp- the RR_t is allocated to network users in proportion to the peak demand and installed capacity or via proportion of energy production and consumption. It's a Ramsey Pricing that allocates higher costs network users with low elasticity of demand. It is ideal for small system and where there is no nodal pricing framework in the electricity market/sector.
b) Long-Run Marginal Cost- which is closely related to postage stamp, it allocates Long Run costs of running the network to users based on their marginal contributions. The LRMC is based on sets of assumptions and thus the number may vary from the calculated ones during implementation. It is also possible to have negative tariffs under LRMC, which may not yield the ideal scenario for recovering costs.
c) Flow-Based Methods like contract path, and extent of use- they require the modelling of the distribution and transmission network and load flow analysis undertaken to determine the critical path and the user pays based on the Revenue Requirement of each path. It's ideal for large transmission systems and bigger loads which can be modelled easily and the critical path identified. The Ethiopia-Kenya-Tanzania wheeling framework utilized this method for the targeted 2000MW power business between the 3 countries using the 500HVDC line and other domestic 400KV-220KV transmission lines.

   Drawback under this methodology, users pay different rates based on their locations, which is different from the current grid framework where electricity customers are charged tariffs based on the voltage level of supply.

   Additionally, the modelling of the network, especially a distribution network, would prove too expensive for the adoption of the methodology, due to limited skillset and the enormous data gathering that it would entail. Every transaction would have to be modelled separately and a specific "wheeling tariff' issued for each transaction.

The revenue requirement allocation framework adopted is the postage stamp method.

2.4 Wheeling Tariff

The regulations underpinning this framework provide for a threshold of 1 MW and 10MW as the minimum wheeling capacity in the distribution and transmission network. Similarly, the operating costs for distribution and transmission networks differ significantly and thus, depending on the utilization, different networks would have different wheeling tariffs. 3 scenarios are modelled under this framework.

- Injections and Withdrawals happening on distribution network alone (66KV and below)
- Injections and withdrawals occurring on the transmission network alone (132KV and above)
- Combined utilization of the distribution and transmission network.

2.4.1 Distribution Network

The methodology utilizes the equation model identified in 2.3 above, with the following adjustments

$$RR_{dt} = \sum_{i=1}^{n} D_{dit} + ROE_{it} + OPEX_{dt} + T_t \quad ,$$ where the subscript *d*, indicating that only distribution assets and related opex are identified and calculated.

The resultant wheeling tariff W_{TD} is obtained by annual generation adjusted for allowed system losses;

$$W_{TD} = \frac{RR_{dt}}{[G_t .(1-L_t)]}$$ where, G_t is the annual energy generated in period t, and L_t is the allowed system losses , as provided by the Authority in the respective year t.

For this wheeling Framework, W_{TD} =Ksh 0.95/kWh

2.4.2 Transmission Network

For transmission grid, the framework recognizes existence of two players, both with transmission WSA, these being KETRACO and KPLC. The revenue allocation methodology combines the transmission assets and their O&M and allocates network users a charge based on the same.

$$RR_{tt} = \sum_{i=1}^{n} D_{tit} + ROE_{tit} + OPEX_{tt} + T_t$$

Where $D_{tit}$is a composite depreciation sum of WSA for both KETRACO and KPLC, $OPEX_{tt}$ represents sum of the transmission O&M for year t.

The resultant W_{TT} =Ksh 0.6/kWh=

$\frac{RR_{tt}}{[G_t .(1-L_t)]}$, with L_t being the allowed system losses in the transmission network,

2.4.3 Composite Tariff for Transmission & Distribution Network

W_{TD} and W_{TT} represent wheeling tariff for power flow resulting from power injections and withdrawals in distributions and transmission network. Where we have flows the system, a separate wheeling tariff is estimated, taking into account the proportion of WSA and Opex in both distribution and transmission network.

$$RR_{t\&d,t} = \sum_{i=1}^{n} D_{t\&d,it} + ROE_{t\&d,it} + OPEX_{t\&d,t} + T_t$$

The resultant tariff,

$W_{T\&D,T}$ =Ksh 1.55/kWh, being the result of

$\frac{RR_{t\&d,t}}{[G_t .(1-L_t)]}$, with L_t being the allowed system losses in the grid.

2.4.4 Other Charges.

The Wheeling tariff payments are due and payable to the Network Service Provider/operator while the Buyer of the wheeled energy/power has additional obligations under the exiting levy orders for power transited and distributed through the grid, these includes;

- The Rural Electrification Program levy of 5% of the value of the energy transited through the network.
- The EPRA Levy of Ksh 0.08/kWh

The Network Service Provider/Operator shall be responsible for collection and remitting the above levies to their respective agencies. For purpose of this, the wheeling service contract shall include disclosure of the applicable cost of the energy/power wheeled.

2.4.5 Fixed payments and Variable Payments

The Network Service Provider/Operator shall provide at least 90% Guaranteed Availability of the network in case of a Firm Wheeling contract, and in exchange, 50% of the wheeling tariff shall be due and payable based on the contracted capacity, the Guaranteed Availability and the number of hours in the billing period. The other percentage shall be based on the actual energy metered in the system.

2.4.6 Availability Adjustment

The wheeling tariff as determined above, and as applicable, shall be adjusted in any billing period based on the Actual Availability, such that;

Actual Wheeling Tariff = $(^{AMA}/_{GA})^{*}\ W_{T\&D,T}$, where AMA is the Actual Monthly Availability, in percentage, and GA is the Guaranteed Availability of 90%. This adjustment shall not apply for actual availability above 90%, in which case the actual wheeling tariff is same as the calculated above.

The availability in this case means ability of the network to carry the Contracted Capacity

In case the AMA is below 90% for three (3) consecutive months, the obligation for fixed shall cease, in which case the contract all payments become variable.

2.4.7 Responsibility

For wheeling service in the Distribution Network, it shall be the responsibility of the Distribution Network Operator/Distribution Service Provider to receive applications, contract and invoice for the wheeling fee and other levies.

For any wheeling service in Transmission Network or composite of the Transmission & Distribution Network, it shall be the responsibility of the Transmission Network Operator to receive application, process, contract and invoice for and collect the wheeling fee and other levies.

2.4.8 Revenue Allocation and Sharing

The wheeling fee revenue arising from Transmission Network as shall be collected, shall be shared among the network operators with transmission assets and apportioned for their asset base, currently KETRACO at 91% and KPLC at 9%.

The wheeling revenue arising from a composite of Transmission and Distribution Network shall be shared among Network Service Providers/operators based on their T&D assets, which currently is 57% KPLC and 43% KETRACO.

3. METERING, ENERGY, LOSSES AND REVENUE ACCOUNTING

3.1 Metering Framework

The Parties shall use KEBS-compliant, approved bi-directional electricity meters at injection and withdrawal points.

The meters shall be able to record Electricity injected and withdrawn at designated injection and withdrawal points to facilitate accurate measurement and verification of electricity wheeled through the transmission and distribution networks. Where applicable, the meters should be able to separately register, reactive energy (kVArh), maximum demand and time-of-use consumption in both directions.

The smart meters shall have an advanced electronic metering system capable of measuring, recording, storing and communicating electricity consumption and generation data at predetermined intervals, with provision for remote meter reading, real-time or near-real-time monitoring, two-way communication and automated data transmission.

The metering arrangements shall provide for main, check/backup meters, where applicable, to ensure accuracy, transparency and reliability of energy accounting and settlement. The meters should be accessible to the Parties in the Wheeling Agreement.

Meter installation, testing, calibration, sealing and periodic verification should be undertaken in accordance with approved procedures, with EPRA and the relevant network service provider retaining appropriate oversight.

3.2 Energy & Losses Accounting

The following shall be the procedure for energy, losses and revenue accounting for the settlement periods:

Step 1: Establish agreed energy schedules

Before each settlement period, the Buyer and Seller shall submit agreed electricity delivery schedules to the System Operator and relevant Network Service Provider. The schedules shall specify the Contracted Capacity quantities (MW/MWh), injection point, withdrawal point, applicable time intervals and relevant network path.

Step 2: Record injected energy

The Seller's at the injection point shall record the Actual Capacity energy/power injected into the network during each settlement interval, and this shall be based on the contracted capacity. The readings shall be collected through the approved meter data management system.

Step 3: Determine system network losses

The allowable loss factor shall be the loss factor approved by the Authority.

3.2.1 Under-Withdrawals and Over-Withdrawals

The energy available for withdrawal shall be calculated after deducting the approved system losses from the actual injected energy.

The proposed calculation is:

$E_{wt} = AC_{jt}.(1 - L)$

Where:

- E_{wt}= Expected Withdrawal at the withdrawal point at time t.
- AC_{jt}= Actual Capacity Energy injected at the injection point at time t.
- L= Applicable approved system loss factor.

Step 5: Record actual withdrawn energy

The Buyer's meter at the withdrawal point shall record the actual electricity received at the withdrawal point for the corresponding settlement interval. Meter readings shall be collected, validated and reconciled against the injection meter readings and applicable loss factors.

Step 6: Determine Under-withdrawals and Over-withdrawals

The difference between the Expected Energy and Actual Energy withdrawn shall constitute the energy deviation for the relevant settlement interval.

If $AC_{wt} > E_{wt}$ such that

$$AC_{wt} - E_{wt} < 0, then$$

$AC_{wt} - E_{wt} = Z_{wt}$, and thus

$\sum_{t=1}^{n} Z_{wt}$ constitute an Over-Withdrawal in time n- settlement period.

The case for Under-Withdrawal

If $AC_{wt} < E_{wt}$ such that

$$AC_{wt} - E_{wt} > 0, then$$

$AC_{wt} - E_{wt} = X_{wt}$, and thus

$\sum_{t=1}^{n} X_{wt}$ constitute an Under-Withdrawal in time n-settlement period.

Where, AC_{wt} is the Actual withdrawn Energy in time t

E_{wt} is the Expected withdrawn Energy in time t

n is the settlement period, say 30 days of a month.

A positive deviation represents utilization of non-contracted power from the grid which the Buyer shall be liable to pay the retailer (in this case KPLC) at the prevailing approved charge rates plus the pass-through costs.

A negative deviation represents underutilization of the energy by the Buyer. Neither the party generating the power nor the network operator shall be obligated to compensate the underutilization/consumption of any portion of contracted capacity/energy that is not offtaken by the Buyer.

Step 7: Verification and reconciliation

The System Operator and relevant network service provider shall undertake monthly reconciliation of the energy schedules, injection meter readings, withdrawal meter

readings and applicable loss factors. Any discrepancies shall be investigated and attributed to the responsible party before the settlement statement is issued.

3.2.2 Measurement of Over-delivery and Under-delivery

$$\boldsymbol{AC_{jt} > CC_{jt}} \textit{ such that } \boldsymbol{AC_{jt} - CC_{jt} > 0}, \textit{then}$$

$\boldsymbol{AC_{jt} - CC_{jt} = Z_{jt}}$ **and** $\boldsymbol{\sum_{t=1}^{n} Z_{jt}}$ *constitute an Over-Delivery in any settlement period n*

On the other hand

If $\boldsymbol{AC_{jt} < CC_{jt}}$ *such that* $\boldsymbol{AC_{jt} - CC_{jt} < 0}$, *then*

$\boldsymbol{AC_{jt} - CC_{jt} = X_{jt}}$ and $\boldsymbol{\sum_{t=1}^{n} X_{jt}}$ *constitute an Under-delivery in any settlement period n, iff*

$\sum_{t=1}^{n} X_{wt} \leq \boldsymbol{\sum_{t=1}^{n} X_{jt}}$, *otherwise under delivery shall be*

$\boldsymbol{AC_{jt}} - AC_{wt}$, *aggregating to* $\sum_{t=1}^{n}\{\boldsymbol{AC_{jt}} - AC_{wt}\}$

Where $\boldsymbol{AC_{jt}}$ is the Actual Capacity/Energy injected at time t and $\boldsymbol{CC_{jt}}$ is the Contracted Capacity/energy at the Injection Point time t

(i) Over-delivery

Over-delivery shall occur where the Actual Energy Withdrawn by the off-taker/Buyer exceeds the agreed or scheduled energy quantity at the withdrawal point, after adjustment for the applicable approved system loss factors.

Proposed treatment for over delivery;

i. Where the generator has injected additional energy with the consent or approval of the System Operator and buyer, the excess shall be compensated at the agreed contractual or approved imbalance settlement price.

ii. Where excess energy is received without prior scheduling or authorization, it shall be deemed lost, and no compensation whatsoever shall be levied or demanded for the same

(ii) Under-delivery

Under-delivery shall occur where the actual energy withdrawn by the off-taker is below the agreed or scheduled energy quantity at the withdrawal point, after adjustment for approved losses.

Proposed treatment:

- Where under-delivery is attributable to the generator's failure to supply scheduled energy, the generator shall bear the applicable imbalance charges or contractual penalties.
- Where under-delivery arises from transmission or distribution network constraints, planned outages, forced outages or System Operator-directed curtailment, the shortfall shall be attributed to the responsible network or system operational event and treated in accordance with the contractual arrangements.
- Where under-delivery results from the off-taker's inability or failure to receive scheduled energy, the off-taker shall bear the applicable contractual charges.
- Where the shortfall arises from force majeure or other approved exceptional circumstances, the affected party shall be treated in accordance with the applicable contractual provisions.

3.2.3 Energy loss reconciliation and allocation of excess losses

i. Losses within the approved energy loss allowance shall be recognized as normal network losses and allocated in accordance with the approved wheeling tariff.

ii. Excess losses beyond the allowed shall be borne by the responsible Network Service Provider.

iii. Excess losses attributable to generator-side equipment or off-taker-side installations shall be borne by the respective responsible party.

iv. Losses arising from meter inaccuracies, tampering or data errors shall be corrected through verified meter readings, approved estimation procedures and subsequent settlement adjustments.

3.3 Network Congestion Management

Network congestion occurs when the demand for transmission or distribution capacity exceeds the available capacity of a network component. In management of the congested network, the system operator shall not discriminate any specific customer

The System Operator shall determine dispatch and curtailment priorities in accordance with the Grid Code, applicable market rules, network security requirements and the terms of approved wheeling agreements. Curtailment shall be undertaken transparently, objectively and on a non-discriminatory basis.

4. TESTING & COMMISSIONING

Testing, Commissioning and Verification of Wheeling Metering Systems

Scope

All metering installations used for electricity wheeling shall be tested, commissioned and verified in compliance with the **metering chapter in the Grid Code** before being approved for commercial operation. The tests shall cover the accuracy and functionality of energy meters, suitability and performance of current and voltage transformers, secondary wiring, polarity, phase sequence, meter configuration, import/export energy registration, reactive energy measurement, time synchronisation, communication and remote data acquisition and security of metering systems.

Witnessing and/or Regulatory oversight

Meter testing and commissioning shall be witnessed by the relevant Network Service Provider, the System Operator, the generator and the wheeling customer, with EPRA retaining regulatory oversight and the right to witness or independently verify the tests. The aforementioned parties shall be given reasonable prior notice and an opportunity to witness the testing and commissioning of the metering installation.

Documentation and corrective actions

The commissioning results shall be documented in a jointly signed commissioning report, indicating the tests conducted, results obtained, identified defects, corrective actions and acceptance of the metering installation for commercial energy accounting and settlement. Corrective action shall be undertaken within 48 hours of discovery of the fault or non-compliance

Metering and end-to-end verification

The metering system shall be capable of recording bidirectional active and reactive energy flows, maximum demand and interval energy data at the approved settlement intervals. Main and check metering arrangements shall be provided at designated settlement points in accordance with the applicable metering requirements.

The commissioning process shall include end-to-end verification of energy measurements at generator injection, network interface and customer withdrawal points to establish the integrity of energy accounting and loss allocation.

Calibration Standards

All tests shall be undertaken using calibrated test equipment and in accordance with **applicable Kenyan and IEC standards, and the relevant sections of Grid Code.** Commissioning reports and test certificates shall be submitted to the designated network service provider and made available to the Authority and System Operator for verification.

Approval Documentation

Before approving a wheeling metering installation, the network service provider shall inter alia submit the following to the system operator:

a) Approved metering scheme and single-line diagrams.
b) CT and VT technical specifications and test certificates.
c) Meter manufacturer's calibration certificates.
d) CT/VT ratio, polarity and accuracy test reports.
e) Meter configuration and programming records.
f) Meter installation and wiring test reports.
g) Communication and remote interrogation test reports.
h) Main and check meter comparison results.
i) Time synchronisation verification.
j) Meter sealing and commissioning certificates.
k) Meter identification numbers and location records.
l) Signed commissioning and acceptance report

Frequency of meter reading

There shall be daily remote retrieval of meter readings, using 30-minute metering intervals, with monthly energy accounting and settlement and Quarterly Physical meter inspection.

Metering Data Recording Requirements

All wheeling meters shall be capable of recording active energy, reactive energy, maximum demand, voltage, current, frequency and power factor in both directions of power flow, where applicable.

Commercial Approval Operation

No metering installation shall be used for commercial energy settlement until it has been tested, commissioned and formally accepted by the system operator

5. REPORTING

5.1 Purpose & Legal Basis

Parties to the wheeling contracts shall report to the Energy and Petroleum Regulatory Authority ("the Authority"), in line with Energy Act, Cap 314 and the Energy (Electricity Market, Bulk Supply and Open Access) Regulations, 2026. The frequency, deadline and the form of submission shall be determined by the Authority. The Authority will use the information to monitor the electricity market and, approve and review network service contracts and tariffs.

The reporting requirements are pursuant to, and will be read together with, the following provisions;

Instrument	Provision	What it provides
Energy Act (Cap. 314)	Section 10	Sets out the functions of the Authority, including the regulation and licensing of electrical energy undertakings and the approval of tariffs
	Section 10(jj)	Requires the Authority to collect and maintain energy data
	Section 129 and 130(1)(b)	Mandates the Authority to monitor the financial performance of licensees
	Section 137	Requires a transmission licensee to collect, analyse and maintain data on its undertaking, and to monitor and report to the Authority on reliability, quality of supply and quality of service
	Section 141	Requires a distribution licensee to collect, analyse and maintain data on its undertaking, and to monitor and report to the Authority on reliability, quality of supply and quality of service
	Section 211	Gives provision for secrecy of information
	Sections 210 and 221	Prescribe penalties for false or misleading information and for other offences
	Fifth Schedule, Part A, paragraph 3(e)	Assigns the collection and maintenance of energy data to the National Government

Instrument	Provision	What it provides
Regulations, 2026 (LN 79)	Regulation 12(2)(e) and (h)	Requires the system operator to collect and disseminate market data and to submit periodic reports to the Authority
	Regulations 22 and 23(3)(c)	Require licensees in the transitional phase to disclose the price, quantity of energy and power traded. The system operator may impose sanctions to a market participant who breaches market rules and procedures.
	Regulations 25 and 34	Govern bulk supply and open access applications, refusals and agreements
	Regulations 29, 37 to 40 and 42	Govern network tariffs, wheeling charges, energy accounting, imbalance, losses and congestion
	Regulations 43 to 45	Provide for complaints, appeals, offences and penalties

”Regulations, 2026 (LN 79)" means the Energy (Electricity Market, Bulk Supply and Open Access) Regulations, 2026, Legal Notice No. 79, Kenya Gazette Supplement No. 115 of 8 May 2026.

5.2 Scope & Principles

Reporting entity	Persons covered	Basis
Network service provider	Transmission and distribution licensees	Act s.137, 141; Reg. 2
System operator	The person designated by the Authority	Act s. 138; Reg. 12
Generation licensee	Generators selling under open access arrangements	Regs. 13
Retail supply licensee	Retailers serving open access customers	Regs. 16, 21, 22
Eligible consumer or wheeler	Consumers with a demand of not less than 1 MVA on the distribution system or 10 MVA on the transmission system	Regs. 24(3)

Every report submitted shall comply with the following principles.

Principle	Requirement
Accuracy and completeness	The report will be based on metered or audited data, and any estimate will be clearly identified and explained
Timeliness	The report will be submitted by the deadline specified in 5.3
Consistency	The report will be prepared on the same basis and in the same template across reporting periods
Non-discrimination	The same requirements will apply to the incumbent and to new entrants in the same category
Auditability	The report will be supported by records available to the Authority for inspection, retained in accordance with 5.4.5

5.3 Reporting obligations

Licensees will report on their activities. The system operator and network service providers will, in addition, consolidate data received from other participants.

5.3.1 Network Service Providers

A network service provider will report to the Authority as follows.

#	Report	Content	Basis	Frequency
1	Open access applications register	A register of applications received; For each application; technical assessments completed within 30 days; decisions made within 45 days of the system operator's no objection; applications outstanding beyond those periods, with reasons, refusals per application with the reasons to the applicant and the Authority	Reg. 34(2), (3), Reg. 34(5)	Quarterly
2	Agreements	Each initialed wheeling agreement, for approval; confirmation that each approved agreement has been copied to the system operator.	Reg. 34(6), (8)	On submission

#	Report	Content	Basis	Frequency
3	Energy accounting	Energy injected and delivered under each wheeling agreement, by settlement interval, as billed	Reg. 38	Daily, Monthly, Quarterly
4	Charges	Wheeling and use-of-system charges billed, collected and outstanding, per wheeler, and imbalance charges	Reg. 37(3), 39	Monthly
5	Losses	Actual losses against the allowable system losses, and the excess borne by the provider	Reg. 40	Monthly
6	Capacity and congestion	Available transfer capacity by substation or corridor; congestion events and curtailments	Reg. 42	Daily, Monthly, Quarterly
7	Contracts	Network Service Contracts	Act. S 11(h)	On submission
8	Quality of supply	Reliability, quality of supply and quality of service data for open access customers; Grid Code compliance	Act s. 137 (transmission), 141 (distribution); regs. 30, 41	Monthly (SAIDI, SAIFI, CAIDI)

5.3.2 System Operator

The system operator will submit to the Authority the periodic reports required under regulation 12(2)(h), together with the following.

#	Report	Content	Basis	Frequency
1	Market report	Demanded and supplied capacity; market capacity prices; demanded and supplied energy; wheeling capacity; wheeled energy	Reg. 12(2)(h)	Daily, Monthly, Quarterly
2	Declared transactions	Price, quantity of energy and power traded, as declared by licensees	Reg. 22	Monthly
3	Imbalance	Imbalance volumes and charges settled	Reg. 39	Monthly
5	Congestion	Congestion events and the measures taken to manage them	Reg. 42	Event-driven

5.3.3 Generation licensees

A generation licensee selling electrical energy under a bulk supply or open access arrangement will report as follows.

#	Report	Content	Basis	Frequency
1	Transaction declaration	Price, quantity of electrical energy and power traded under each contract, to the system operator	Reg. 22	Per contract; monthly
2	Bulk supply applications	Applications received and responses issued within 30 days	Reg. 25(2)	Per application
3	Refusals	Reasons for each refusal, to the applicant and the Authority	Reg. 25(5)	Per application
4	Agreements	Each initialed bulk supply agreements for approval, Power Purchase Agreements (PPA)s	Reg. 25(3), Act s 11(h)	Per agreement
6	Financial performance	Audited accounts	Act.129 and 130(1)(b)	Annually
7	Delivery performance	Contracted against delivered energy and capacity, and any failure to deliver within contracted timelines	Reg. 23(3)(a)	Monthly

5.3.4 Retail supply licensees

A retail supply licensee will report as follows.

#	Report	Content	Basis	Frequency
2	Customers	Number of open access customers served and their demand	Reg. 16	Quarterly
3	Customer switching	Customer switches, including notices of termination given to the previous retailer	Reg. 21(2)	Quarterly

5.3.5 Eligible consumers and wheelers

An eligible consumer or wheeler will report as follows.

#	Report	Content	Basis	Frequency
1	Schedules and nominations	Schedules or nominations to the system operator, as required by the Grid Code and the wheeling agreement	Reg. 41	Monthly or as scheduled
2	Changes	Any change in contract demand, connection point, supplier or eligibility status, within 14 days of the change	Reg. 35	Event-driven
3	Metering faults	Any metering fault or tampering, immediately upon detection	Reg. 28	Event-driven
4	Information requests	Any information the Authority may require to verify eligibility or resolve a complaint	Regs. 35, 43	Event-driven

5.4 Format, submission, confidentiality, publication and retention

Reports will be submitted electronically in the templates issued by the Authority, will be certified by an authorised officer, and will be published in aggregated form unless confidential.

5.4.1 Format and submission.

Each report will comply with the following requirements.

Requirement	Detail
Channel	Reports will be submitted through the Authority's online portal or designated email address, in the templates issued by the Authority
File format	Numerical data will be submitted in CSV or XLSX format, and narrative reports in PDF format

Requirement	Detail
Certification	Each report will be certified by the Chief Executive Officer or another officer authorized by the board of the reporting entity;
Further information	The reporting entity will respond to any request for clarification or further information within 14 days, or such other period as the Authority may specify

5.4.2 Corrections.

A reporting entity that discovers an error in a report already submitted will file a corrected report within 14 days of the discovery, with an explanation of the correction.

5.4.3 Confidentiality.

A reporting entity may designate specific information as commercially sensitive and will state the reasons for the designation. The Authority will determine whether the information will be treated as confidential.

5.4.4 Publication.

In the interest of market transparency, the following information will be published.

Publisher	Information to be published	Basis	Frequency
System operator	Market data on the online market portal, including traded volumes, wheeling capacity and wheeled energy	Reg. 12(2)(b), (e)	Daily, Monthly
Network service provider	Approved wheeling and use-of-system charges; network access conditions approved under reg. 35(1); available transfer capacity	Regs. 29, 35(1), 42	Annual, and on any change
The Authority	Open access statistics, including applications received and approved, contracts by category, capacity and energy wheeled, and average network charges	Act s. 10(jj); Fifth Schedule, Part A, para. 3(e)	Quarterly

5.4.5 Record retention.

A reporting entity will retain the data and records supporting each report, including meter data, for a period of not less than seven years, and will make them available to the Authority for inspection or audit.

5.4.6 Compliance and enforcement

Late, incomplete or false reporting will constitute non-compliance and will be dealt with in accordance with the Act and the Regulations.

Matter	Consequence	Basis
Review by the Authority	The Authority will review each report and may query or audit it, and may direct the reporting entity to correct or resubmit it within a specified period	Act s. 10
Late or incomplete report	The Authority will issue a notice specifying a period within which to comply; persistent failure will be treated as a breach of licence conditions and may attract enforcement action under the Act	Act s. 10; licence conditions
False or misleading information	The person will commit an offence and will be liable to the penalty prescribed in section 210 of the Act	Reg. 45(1)
Other contravention for which no penalty is expressly stated	The person will be liable to the penalty prescribed in section 221 of the Act	Reg. 45(2)

6. DISPUTES RESOLUTION FRAMEWORK

6.1 Disputes

Disputes between market participants may arise primarily in relation to:

- Refusal of open access or allegations of discriminatory network access
- The computation of wheeling and use-of-system tariffs
- Energy accounting and financial settlement discrepancies
- Allocation of technical network losses
- Transmission congestion curtailment and associated compensation,
- Imbalance charge assessments
- Metering accuracy and calibration
- Non-compliance with Grid Code standards
- The call or realization of performance security
- Payment defaults under Bulk Supply Agreements.

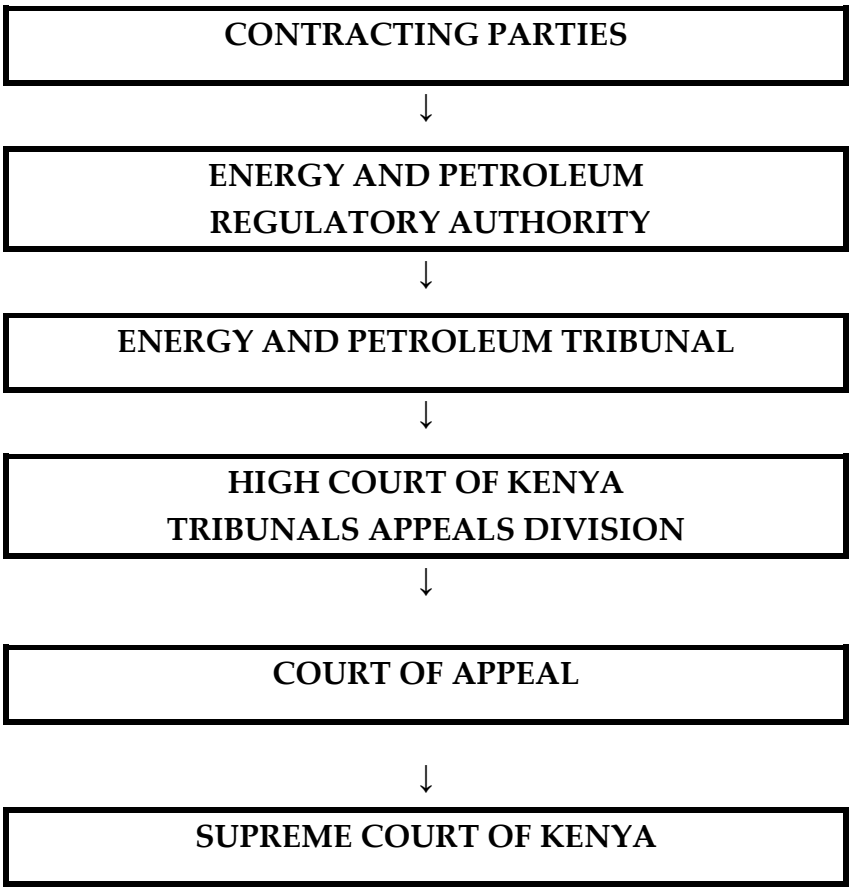
6.2 Dispute Resolution Mechanism.

The Energy (Electricity Market, Bulk Supply and Open Access) Regulations, 2026, establishes a structured, two-tier dispute resolution mechanism:

- **Tier One:** any complaint or dispute arising between contracting or market parties shall in the first instance, be resolved among the parties in accordance with their applicable contractual agreements governing complaints and dispute resolution.
- **Tier Two :** Pursuant to Regulation 43, any complaint or dispute arising between contracting or market parties failure to resolve as per Tier One, shall be referred to the Authority for determination in accordance with the applicable regulations governing complaints and dispute resolution. This jurisdiction encompasses disputes between generators and retailers, generators and eligible consumers, and wheelers and network service providers, as well as controversies concerning tariffs, metering, open access, and bulk supply arrangements.
- **Tier Three – Appeal to the Energy and Petroleum Tribunal:** Pursuant to Regulation 44, any person aggrieved by a decision, order, or determination of the Authority—including decisions relating to the refusal of bulk supply applications or open-access determinations—may lodge an appeal with the Energy and Petroleum Tribunal.

Accordingly, the statutory escalation pathway proceeds sequentially from the disputing contracting parties to the Authority for initial determination, onward to the Energy and Petroleum Tribunal on appeal, and ultimately to the High Court of Kenya on points of law as provided for under the Energy Act, 2019 Section 37(3).

Dispute Resolution process (when required)



7. TEMPLATE FOR WHEELING AGREEMENT

FORMAT OF WHEELING SERVICES AGREEMENT

1. Duration
2. Tariffs (wheeling or use of system charges)
3. Authorization
4. Maximum Capacity
5. Obligation of the parties
6. Source of Supply
7. Area of supply
8. Connection point
9. Metering and energy accounting
10. Connection and use of system conditions
11. Compliance with the directions of the Authority and system operator
12. Grid Code
13. Operating standards
14. Rights of third parties
15. Termination
16. Insurance
17. Liability
18. Force majeure
19. Governing law
20. Dispute Resolution