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**Hydropower Investment
Promotion Project (HIPP)**

ASSESSMENT OF USAID BALANCING AND SETTLEMENT RULES FOR THE ELECTRICITY MARKET IN GEORGIA

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Acronyms Used in this Report

B&S rules	Balancing and Settlement Rules
DAP	Day Ahead Planning
DSO	Distribution System Operator
ESCO	Electricity System Commercial Operator
GNERC	Georgian National Energy and Water Supply Commission
GSE	Georgian State Electrosystem
HIPP	Hydropower Investment Promotion Project
HPP	Hydro Power Plant
MO	Market Operator
MoE	Ministry of Energy of Georgia
MW	Megawatt
MWh	Megawatt Hours
QE	Qualified Enterprise
TSO	Transmission System Operator
WG	Working Group

1. Summary Assessment of USAID Balancing and Settlement Rules and the Market Operator Working Group Versions

The USAID draft on Balancing and Settlement Rules for the Electricity Market in Georgia developed by USAID/HIPP includes four chapters. The discrepancies between the USAID version and the reviewed and revised version by the market development working group (WG) are summarized below:

Chapter I	
General Provisions and Definitions of Preliminary Term in the Electricity Market in Georgia	
General Comment: CH.1 The USAID version had terms that were defined for Day-ahead Planning (DAP) as well for the balancing market. After brief review of the definitions in the MO working group, ESCO suggested to overview only those definitions that were related for DAP. Another suggestion was to use definitions that are presented in the existing legislation in a different way or there will additional terms to be defined.	
Name of the Article	Modifications by the Market Development Working Group
	Term “Market Participant” was changed to “Qualified Enterprise” Added definitions: Paragraph 69. “Settlement Aggregation Entity” and Paragraph 70. “Aggregation”.
Chapter 2. DAP procedures regarding generation, consumption and trade scheduling.	
General Comment: WG has done initial review of this chapter, there were on minor comments.	
Chapter 3. Calculation of the energy imbalance volume of a market participant in a settlement period	
General Comment: The main principles and calculation of the energy imbalance methodologies were agreed. ESCO suggested changes in formulas where transmission losses were included as a variable. Correspondingly, transmission system loss factor was included in formulas as it is currently calculated for Georgian Electricity Market (system losses). Transmission loss methodology remains to be developed.	
Name of the Article	Modifications by the Market Development Working Group
Article 8. Calculation of Settlement volumes	Settlement Supply Volume was defined as a net volume supplied to the grid, while Settlement Withdrawal Volume is a

	physical withdrawal from the relevant grid plus Average System Loss Factor
Article 11. Determination of accepted offer volumes for offers accepted within the context of balancing electricity market	System loss factor was taken out from generation side and it is applicable only if consumption entity provides balancing service (Up-regulation)
Article 12. Determination of accepted bid volumes for bids accepted within the context of balancing electricity market	System loss factor was taken out from generation side and it is applicable only if consumption entity provides balancing service (Down-regulation).
Chapter 4. Rules on Metering Data	
General Comment: The main unsolved issue is which entity (MO or TSO) should validate the commercial metered data. During the WG meetings GSE and ESCO never came into agreement. Both entities agree that ESCO should have access on Alpha Center data, however GSE thinks that TSO should validate and approve settlement data while ESCO thinks that the latter is the responsibility to the MO due to its responsibility for settlements.	
Name of the Article	Modifications by the Market Development Working Group
Article 13. Scope	The article was re-arranged, and the order of paragraphs was changed. Phrase “as it is defined in the License for the MO issued by GNERC” was replaced by: “MO to fulfil its responsibilities”
Article 14. Responsible Parties 1) MO 2) TSO 3) DSO 4) Market Participants	Major change was to assign responsibility of validation metered data to MO instead of GSE. Other changes are: 1) MO: clause that obliged MO to develop aggregation rules was deleted; 2) TSO is no more responsible for establishing and managing electricity wholesale market metering database and validation of metered data; 3) DSO: Term “Retail Public Supplier” was taken out and instead general term “Qualified Enterprise” or “QE” was inserted; 4) QEs: Clause “Registration of an installation of a market participant on the electricity market with incomplete list of the metering points for the relevant installation shall not be allowed” was deleted. The Table that illustrated responsibilities of QEs was replaced by a narrative format

	to be compliant with Georgian Legislation.
ARTICLE 15. Metering Data Collection	Time intervals for transferring metering values should be defined by B&S rules, not Transmission Grid Code Paragraph 3 was deleted, which stated: “(3) Metered volumes should be read remotely. Metered volumes of embedded generation connected to distribution network shall be provided to TSO via DSO “Alpha Center” on real time basis”. A clause from paragraph 6: “in addition, metered market participants may authorize other market participants to access their specific delivery point data” was deleted.
ARTICLE 16. Requirements for the metering systems	Embedded change: MO is responsible for registering, testing and coding metering devices of QEs.
ARTICLE 17. Metering and certification of the metered quantities	The article was re-arranged. New paragraph 4 was added: MO is obliged to send metered values back to QEs and TSO. MO is responsible for “filling” missing data. The transmission/distribution network connection agreement to be registered also with MO.
ARTICLE 18. Aggregation and submission of the metered values	The article was re-arranged. Embedded change: MO superseded TSO on determining physical withdrawal/supply for each consumer/producer.
ARTICLE 19. Determination of the technological losses in the network	There is disagreement between GSE and ESCO related to time frame in which technological losses should be determined. GSE thinks that it should be calculated for the settlement period (month), while ESCO believes that it should be for the calculation period (sum of the calculation periods equals to the settlement period). (Annex 1 clarifies the calculation period).
ARTICLE 20. Aggregation of metered values as in regards to the implementation of the activity „Imbalances settlement“ by the MO.	ESCO added paragraph (2) which reads that in case TSO will not provide information before the determined deadline to MO, the latter independently will determine necessary information) based on Alpha-Center data.

2. Annex A: List of Market Development Working Group members

	Name, Second name	Name of the Organization
1	Irina Milorava (Head of the group)	ESCO
2	Zaza Dvalishvili	ESCO
3	Vakhtang Ambokadze	ESCO
4	Keti Sandroshvili	ESCO
5	Rusudan Mazmiashvili	ESCO
6	Luiza Macharadze	ESCO
7	David Namchevadze	ESCO
8	Natalia Chiokadze	ESCO
9	Sofio Orjonikidze	ESCO
10	Irma Khatiskatsi	ESCO
11	David Dgebuadze	GSE
12	Mikheil Tavberidze	GSE
13	Dato Dvali	GSE
14	Giorgi Shukakidze	MoE
15	Valerian Khavtasi	MoE
16	Zurab Gordeziani	Energo-pro Georgia
17	Nino Orjonikidze	Energo-pro Georgia
18	Misha Antadze	JSC Telasi
19	Gergana Stoitcheva	HIPP
20	Ivane Pirveli	HIPP
21	Nikoloz Sumbadze	HIPP
22	Zviad Gachechiladze	HIPP
23	Mariam Ioseliani	HIPP

3. Annex B: Electricity Market Balancing and Settlement Rules, (based on the updates and modifications by the Market Development Working Group Version)

Electricity Market Balancing and Settlement Rules

Balancing and Settlement Rules will be a key part of the Market Regulations for the electricity market in Georgia

The Balancing and Settlement Rules hereinafter referred to as the "Rules", regulate:

1. General provisions and definitions of preliminary terms in the electricity market;
2. Rules for the Day-ahead planning (DAP) process;
3. Rules of the balancing electricity market;
4. Rules for conclusion of transactions for electricity at regulated and freely negotiated prices through bilateral contracts;
5. Rules for conclusion of transactions on the Day-ahead market (DAM);
6. Rules for registration of balance responsible parties, suppliers of ancillary services and balancing electricity providers;
7. Procedures for registration of hourly schedules and settlement between the market participants and the Market Operator (MO);
8. Requirements for the submission of data for the metered quantities of electricity to the MO and balance responsible parties;
9. Requirements for data exchange between the market participants;
10. Rules for settlement, the principles of balancing and the methods for balancing energy price determination;
11. Electricity market monitoring;
12. Procedures for implementing amendments in the rules.

Chapter I

General Provisions and Definitions of Preliminary Terms in the Electricity Market

Objective

ARTICLE 1 – (1) The objective of these Rules is to set forth the principles and procedures regarding balancing of the active electricity demand and supply and settlement.

Scope

ARTICLE 2 - (1) These rules cover duties, powers and responsibilities of the parties involved in balancing mechanism and settlement, and the principles and procedures applicable to the balancing of active electricity supply and demand as well as the financial settlement of the credits and debits of licensees arising from participation in balancing mechanism and settlement.

Legal Basis

ARTICLE 3 - (1) These Rules have been prepared based on Georgian Law on Electricity and Natural Gas.

Definitions

ARTICLE 4 - (1) For the purposes of these Rules, the following terms shall bear the following meanings:

1. Transmission System Operator (TSO): A centralized institution which is responsible for ensuring the safe and reliable operation of the overall power system.
2. Automatic Meter Reading System (AMRS): The system which will be installed by Transmission System Operator and distribution license holder legal entities, and which will cover the required software, hardware and communication infrastructure for automatic remote reading of meter data, transferring data to a central system, validating, filling the missing data and submitting them to the relevant parties in the desired format.
3. Distribution Region: The region defined in a distribution license.
4. Distribution Licensee: distribution license holder companies and distribution license holder legal entities.
5. Distribution System: The electricity distribution facilities and grid which a distribution company operates and/or owns in its designated region.
6. Market Operator (MO): A centralized institution which operates an organized wholesale market for the (commercial) exchange of energy or other products on behalf of market participants.
7. Balance Responsible Group: The group formed by notification to Market Operator by market participants and in which one participant among group undertakes the obligations regarding balance responsibility on behalf of the group.
8. Balance Responsible Party: The market participant that takes over on behalf of the balance responsible group the financial liability against the Market Operator for the energy imbalance of the balance responsible group or that is not part of any balance responsible group.
9. Balancing: The activities performed to ensure balance between electricity demand and supply.
10. Balancing Entity: Generation or consumption facility or part of the generation or consumption facility eligible to participate in the balancing electricity market.
11. Balancing Power Market: The organized wholesale electricity market, which is operated by the Transmission System Operator and Market Operator and where the reserve capacity, is sold or purchased, to serve the purpose of real-time balancing of demand and supply.
12. Balancing Mechanism: The activities which complement bilateral contracts and which consist of day ahead balancing and real-time balancing.
13. Bilateral Contracts: Contracts for the exchange of electricity (energy) that are directly concluded between two market participants. Bilateral contracts may take the form of either physical or financial contracts.

14. Block Sales Bid: Active electricity sales bids that are valid for more than one consecutive hour for the next day, including average price and average quantity information for the time interval it spans and submitted by market participants that participate to the day ahead market.
15. ENTSO: European Network of Electricity Transmission System Operators.
16. Invoicing Period: The period begins at 00:00 hours on the first day of a calendar month and ends at 24:00 hours on the last day of that month.
17. Real-time Balancing: The actions carried out by the System Operator in order to balance the supply and demand of active electricity energy in real-time.
18. Day Ahead Planning: The actions carried out under the coordination of Market Operator in order to balance the foreseen hourly demand regarding the following day on the day ahead, until when Day ahead market will be initiated.
19. Day Ahead Generation/Consumption Schedule (DGS): The hourly generation or consumption values with respect to settlement delivery point which a settlement aggregation entity anticipates to realize in the following day and notifies the Market Operator at the beginning of day ahead balancing stage, according to the obligations of the balance responsible party to which it is attached.
20. Day Ahead Balancing: The activities regarding day ahead planning or day ahead market intended to ensure the day ahead balancing of supply and demand in the system, as well as balancing of the contractual commitments and generation and/or consumption plans of market participants.
21. Day Ahead Price: The system marginal prices determined under day ahead planning or the final market clearing price determined in the Day ahead market.
22. Day Ahead Market: The organized wholesale electricity market established for purchase and sale transactions of electricity to be delivered in the day ahead on the basis of settlement period and that is operated by the Market Operator.
23. Day Ahead Market Price: Final market clearing price.
24. Day Ahead Market Participation Agreement: The standard agreement including requirements and rules about market participant's attendance to Day ahead market and management of the day ahead market by the Market Operator.
25. Day Ahead Market Bids: Single hour purchase and sales bids, block purchase and sales bids and flexible sales bids that are submitted by market participants that participate in Day Ahead Market.
26. Distribution system operator (DSO): A legal entity responsible for operating, ensuring the maintenance of and, if necessary, developing the distribution system in a given area and, where applicable, its interconnections with other systems and for ensuring the long-term ability of the system to meet reasonable demands for the distribution of electricity.
27. Market Management System (MMS): The applications that are working as thin client aimed at executing the balancing mechanism and settlement transactions and accessible by the Market Operator, the Transmission System Operator, market participants and transmission and distribution license holder legal entities.

28. Day Ahead Planning Module: The software module that takes place in the context of MMS and used by the Market Operator and the Transmission System Operator within the framework of day ahead planning in order to determine system marginal prices and prepare Day ahead schedule such that balancing costs will be minimized.
29. Day Ahead Schedule: The national scale generation/consumption schedule prepared for the following day, as a result of day ahead balancing activities.
30. Day Ahead System Sales Bids: The hourly, block and flexible sales bids submitted within the framework of day ahead balancing activities.
31. Day Ahead System Purchase Bids: The hourly and block purchase bids submitted within the framework of day ahead balancing activities.
32. Flexible Sales Bid: Single hour active electricity sales bids submitted by market participants that participate to the day ahead balancing activities for the next day but that is not related to a certain hour.
33. Transmission: The transport of electricity through high voltage electricity lines as defined in Georgian Law on Electricity and Natural Gas.
34. Transmission Capacity: The amount of electric power that can be sent / received from any point of the transmission system, as expressed in megawatt (MW) terms.
35. Transmission System: Electricity transmission facilities and network.
36. Transmission System Configuration: Calculation rules that includes information such as the meters, which will be considered in order to calculate the electricity supplied to a transmission system or electricity withdrawn from the transmission system and, direction of the meters in terms of supply and withdraw, loss coefficient that will be applied to meters.
37. Relevant Legislation: The laws, regulations, communiqués, circulars and Board decisions regarding the electricity market as well as licenses held by the relevant legal entities.
38. Law: Georgian Law on Electricity and Natural Gas
39. Final Day Ahead Generation/Consumption Schedule (FDGS): The hourly generation or consumption values which a settlement aggregation entity anticipates to realize in the following day and notifies the Transmission System Operator at the opening of the balancing power market according to the obligations of the balance responsible party to which it is attached and the result of day ahead balancing.
40. Congestion Management: The methods used for the elimination of any congestion that has arisen or is foreseen to arise in the transmission system.
41. Central Settlement Bank: Bank used by the Market Operator and market participants for carrying out operations regarding payments and collaterals within the scope of this Regulation.
42. Central Settlement Bank Agreement: Agreement that will be signed between Market Operator and central settlement bank and that consists of duties and responsibilities of the parties regarding collateral management and payments.

43. Central Settlement Bank – Market Participant Agreement: Agreement that will be prepared by the Market Operator and will be signed between market participants and central settlement bank, with regard to collateral management and cash payment services.
44. Organized Wholesale Electricity Market: Electricity markets such as Day-ahead market, balancing power market, ancillary services market, operated by the Market Operator and/or the Transmission System Operator where wholesale trade of electricity energy, capacity or derivatives takes place.
45. Market Participation Agreement: The standard agreement covering the provisions and conditions regarding the operation of balancing mechanism by the Market Operator and System Operator and the participation of the market participant in the balancing mechanism excluding Day Ahead Market.
46. Market Participant: entities that operate in a competitive environment and that are active in the electricity market to either buy or sell electricity for commercial purposes.
47. System: Electricity transmission system and distribution systems.
48. System Purchase Bid Volume: The volumes of decrease in generation or increase in consumption, which market participants participating in Day ahead balancing activities propose to undertake in the related balancing entity.
49. System Purchase Instruction: The notifications issued by the Transmission System Operator or Market Operator to the related market participants, for purchase or sell of the market participants participating in day ahead planning.
50. System Imbalance Price: The price applied for the electricity imbalances of market participants arising from their balance responsibilities as determined for each settlement period.
51. Demand Forecast: The hourly consumption forecasts published on a daily basis by the Transmission System Operator.
52. Instruction: Up-regulation or down-regulation instruction.
53. Consumption: Electricity consumption.
54. Consumption Unit: Facilities where electricity is consumed.
55. Settlement: The activities of calculating the amounts payable and receivable due to balancing mechanism and/or energy imbalances and of preparing the related payable-receivable notices.
56. Settlement Period: The periods taken as a basis for settlement transactions.
57. Settlement Delivery Point: Transmission system connection point where consumption or export from the transmission system occurs and that is subject to transmission system loss.
58. Settlement Volume: The value regarding the reading on the basis of active electricity energy settlement delivery point, which is taken from meters in the settlement aggregation entity configuration to be used as a basis in the settlement calculations.

59. Entity: Generation or consumption facility or part of the generation or consumption facility eligible to participate in the market.
60. Generation: The transformation of energy resources into electricity energy in generation facilities.
61. Tariff Customers: Electricity consumers that are connected to a Distribution System and purchase electricity from their RPSs at rates regulated by the Georgian National Energy and Water Supply Regulatory Commission (GNERC).
62. Retail Public Suppliers (RPSs): Legal entity that supplies electricity only to Tariff Customers under tariffs and pursuant to contracts that have been approved by the GNERC.
63. Generation Facility: The facilities where electricity energy is generated
64. Ancillary Services: System services those are essential for the proper functioning of the Transmission Grid.
65. Up-regulation: The situation where a balancing entity sells electricity to the system by increasing its generation or decreasing its consumption in line with the instructions issued by the Transmission System Operator.
66. Up-regulation Instruction: The notifications issued by the Transmission System Operator or Market Operator to the related market participants, for up-regulation of the market participants participating in balancing power market.
67. Down-regulation: The situation where a balancing entity buys energy from the system by decreasing its generation or increasing its consumption, in line with the instructions issued by System Operator.
68. Down-regulation Instruction: The notifications issued by the System Operator or Market Operator to the related market participants, for down-regulation of the market participants participating in balancing power market.
69. Settlement Aggregation Entity: Active electric energy generating or consuming entities which are defined by market participants and registered via MMS so that the settlement calculations for each market participants can be made,
70. Aggregation: is a process in which information is gathered and expressed in a summary form, for purposes of calculating the settlement aggregation volumes of settlement aggregation entities; direction of the meters in terms of supply or withdraw and on behalf of which market participant the meter is registered to.

Chapter II

Draft Interim Rules for Day-ahead Planning

Section One

General Provisions

Principles of day ahead planning

ARTICLE 5 – (1) Day ahead planning shall be executed according to the provisions of these Rules, with due regard also to the Transmission Code such that the foreseen hourly demand for the day ahead will be balanced while

- a) ensuring operational security and system integrity,
- b) satisfying supply security and supply quality criteria,
- c) minimizing balancing costs for the Transmission System Operator.

(2) Transactions related to the day ahead planning are executed on the basis of below principles:

- a) All market participants shall participate in day ahead planning;
- b) Day-ahead planning transactions are executed daily on an hourly basis. Each day consists of time intervals starting at 00:00 and ending next day at 00:00.

Section Two

DAP procedures regarding generation, consumption and trade scheduling

Generation and consumption schedules

ARTICLE 6. (1) Day ahead planning shall be executed on a daily basis and shall consist of the following steps:

- (1) Day ahead generation schedules shall be sent to the Market Operator by all producers, connected to the transmission network, before 10:00 hour on the day, preceding the Delivery day, and shall contain information for the gross and net generation of the plant including bilaterally contracted volumes and planned sales to the system.
- (2) The import - export schedule for cross-border exchange shall be sent before 10:00 hour of each day to the Transmission System Operator in a single file with a standard form, approved by the Transmission System Operator, and shall contain information on the quantities of electricity for each hour of the Delivery Day.
- (3) Until 10:00 hours each day, all market participants shall notify Market Operator via MMS regarding total consumption forecasts for each hour of the following day concerning consumption units registered under each market participant including bilaterally contracted volumes and planned purchase from the system.
- (4) By 10:00 hours each day, the Transmission System Operator shall announce the demand forecast and possible system congestions for the following day via MMS.
- (5) The demand forecast announced by the Transmission System Operator shall contain information on total demand (MWh) to be met by all generation facilities in the system for each hour between 00:00 and 24:00 hours on the day that follows the day of announcement.
- (6) Between 10:00 and 11:30 hours each day the Market Operator shall prepare the non-constrained generation/consumption schedule that will balance the forecast hourly demand, for each hour of the day ahead, via the day ahead planning module of MMS. The hourly consumption schedules shall contain information on

the planned consumption, according to the concluded contracts and the procedures, provided in the Transmission Grid Code and these Rules and shall be sent within the specified schedule.

- (7) Between 11:30 and 12:30 hours each day; the market participants participating in day ahead planning shall check whether or not the system instructions issued by the Market Operator for day ahead planning are consistent with the related system load, and may object to the Market Operator regarding inconsistent instructions.
- (8) Between 12:30 and 13:00 hours each day; the Market Operator shall evaluate the objections and if necessary, re-determine the day ahead planning, to the related market participants.
- (9) Until 13:00 hours of each day the Market Operator shall conclude the final day ahead planning schedule.
- (10) Between 13:00 and 15:00 hour of each day and the Transmission System Operator (TSO), on the basis of the generation schedules and the consumption schedules and his own demand forecast, defined in paragraphs (6) and (5) correspondingly, shall determine the required primary, secondary, and contingency reserve for the next day, necessary for:
 - supporting the balance between the generation and the consumption in real time;
 - ensuring a secure and reliable electricity supply;
 - maintaining reserve capacity in the cases of unplanned emergency situations in the network and the generation capacities and changes in the climate conditions;
 - congestion management.
- (11) By 15:30 hour each day, MO announces Final Hourly Generation\Consumption Schedule, for the next day, based on TSO's modifications.
- (12) The confirmed by the Market Operator export-import schedules, generation schedules and consumption schedules, including system sales and purchases, shall present the basis for determination of the imbalances of the market participants.

Section Three

Calculations of hourly imbalances for a Market Participant

Calculation of the energy imbalance volume of a market participant in a settlement period

ARTICLE 7 - (1) The subject of settlement's imbalance for every trading hour is, a sum of differences between actually supplied and contracted volumes of electricity for electricity supply and of difference between actually consumed and contracted volumes of electricity for electricity consumption.

For an invoicing period, the energy imbalance volume of each market participant in each settlement period shall be calculated according to the following formula:

$$EIV_{p,u} = \sum_{b=1}^k (ESSV_{p,b,u} - ESWV_{p,b,u}) + CV_{p,u} - FEIV_{p,u} + \left(\sum_{r=1}^n SPV_{p,u,r} - \sum_{r=1}^m SSV_{p,u,r} \right) + \left(\sum_{r=1}^{12} AFOV_{d,u,r} - \sum_{r=1}^{11} AFBV_{d,u,r} \right)$$

(2) where;

- $EIV_{p,t,u}$ is the Energy Imbalance Volume (MWh) for the settlement period “u” of market participant “p”,
- $ESSV_{p,b,u}$ is the Settlement Supply Volume (MWh) for settlement period “u” of settlement aggregation entity “b” within the context of the balance responsibility of a market participant “p”, that equals to the supply volume to the electricity system(networks).
- $ESWV_{p,b,u}$ is the Settlement Withdrawal Volume (MWh) for settlement period “u” of settlement aggregation entity “b” within the context of the balance responsibility of a market participant “p”, which is calculated pursuant to Article 8,
- $CV_{p,u}$ is the Contract Volume (MWh) of a market participant “p”, in settlement period “u”, which is calculated pursuant to Article 9,
- $FEIV_{p,u}$ is the Foreseen Energy Imbalance Volume (MWh) of the market participant “p”, anticipated from the day ahead for the settlement period “u” which is calculated as part of day ahead planning pursuant to Article 10,
- $SSV_{p,u,r}$ is the System Sales Volume (MWh) of market participant “p” under its offer “r” valid for settlement period “u”, determined after day ahead planning,
- $SPV_{p,u,r}$ is the System Purchase Volume (MWh) of market participant “p” under its bid “r” valid for settlement period “u”,
- k is the number of settlement aggregation entities under the balance responsibility of market participant “p” valid for the settlement period “u”,
- n is the number of bids/offers under which market participant “p” has sold to the system valid for the settlement period “u”,

- m is the number of bids/offers under which market participant “p” has purchased from the system valid for the settlement period “u”,
- AFOV_{d,u,r} is the accepted and fulfilled offer volume (MWh) of the offer “r” of balancing entity “d”, valid for the settlement period “u”, calculated under pursuant to article 11,
- t1 is the number of accepted offers of balancing entity “d” in the balancing power market, for the settlement period “u”,
- AFBV_{d,u,r} is the accepted and fulfilled bid volume (MWh) of the “r” of balancing entity “d”, valid for the settlement period “u”, calculated under pursuant to article 12
- t2 is the number of accepted bids of balancing entity “d” in the balancing power market, for the settlement period “u”.

Calculation of settlement volumes

ARTICLE 8 - (1) The settlement volumes of settlement aggregation entities shall be calculated according to the following formula:

$$ESWV_{b,u} = PSWV_{b,u} / (1 - ASLF_u)$$

(2) where;

- ESWV_{b,u} is the Settlement Withdrawal Volume (MWh) of Settlement Aggregation Entity “b” for settlement period “u”,
- TSSV_{b,u} is the net Withdrawal Volume (MWh) of Settlement Aggregation Entity “b” from the electricity system for settlement period “u”,
- ASLF_u is the Average System Loss Factor for settlement period “u”,

Calculation of the contract volumes

ARTICLE 9 - (1) Contract volumes of a market participant “p” for the settlement period “u” shall be calculated according to the following formula:

$$CV_{p,u} = \sum_{z2=1}^m CNS_{p,u,z2} - \sum_{z1=1}^n CNS_{p,u,z1}$$

(2) where;

- $CV_{p,u}$ is the Contract Volume (MWh) of the market participant “p”, for the settlement period “u”,
- $CNS_{p,u,z1}$ is the Contract Notification (MWh) of the market participant “p” for electricity sales to market participant “z1” in settlement period “u”,
- $CNS_{p,u,z2}$ is the Contract Notification (MWh) regarding market participant “p”, which is made for energy purchase from the market participant “z2” in settlement period “u”,
- n is the number of market participants to which the market participant “p” sells electricity, in settlement period “u”,
- m is the number of market participants from which the market participant “p” purchases electricity, in settlement period “u”.

Calculation of foreseen Day-ahead imbalance volume in the day ahead planning process

ARTICLE 10 - (1) For a particular invoicing period on settlement period basis the foreseen day ahead imbalance volume amount for every market participant participating in the day ahead planning is calculated according to following formula:

$$FEIV_{p,u} = DAGS_{p,u} + CV_{p,u}$$

(2) where;

- $FEIV_{p,u}$ is the Foreseen Day Ahead Electricity Imbalance Volume (MWh) of market participant “p” regarding settlement period “u”,
- $DAGS_{p,u}$ is the Day Ahead Generation/Consumption Schedule (MWh) submitted by market participant “p” to the Market Operator for settlement period “u”, that has positive value for supply to the system and negative value for withdrawal from the system,
- $CV_{p,u}$ is the Contract Volume (MWh) of market participant “p” for settlement period “u” that is calculated pursuant to Article 9,

Determination of accepted offer volumes for offers accepted within the context of balancing electricity market

ARTICLE 11 - (1) The accepted offer volumes to be applied to each balancing entity within the context of balancing electricity market for an invoicing period, in connection with the

up-regulation instructions issued for each settlement period, shall be calculated according to the following formula:

$$AFOV_{d,u,r} = \frac{URIV_{d,u,r}}{(1 - ASLF_u)^g} \times (t_2 - t_1) / 60$$

(2) where;

$AFOV_{d,u,r}$ is the accepted and fulfilled offer volume (MWh) within the context of balancing electricity market, regarding the offer “r” of balancing entity “d”, which is valid for the settlement period “u”,

$URIV_{d,u,r}$ is the up-regulation instruction volume (MWh) given by the System Operator and realized regarding offer “r” of balancing entity “d”, within the context of balancing electricity market, valid for the settlement period “u”,

$ASLF_u$ is the Average System Loss Factor for settlement period “u”,

t_1 is the start time of up-regulation instruction as hour and minutes, given by the System Operator regarding offer “r” of balancing entity “d”, within the context of balancing electricity market, valid for the settlement period “u”,

t_2 is the end of up-regulation instruction as hour and minutes, issued by the System Operator regarding offer “r” of balancing entity “d”, within the context of balancing electricity market, valid for the settlement period “u”.

g is the tag value of the offer of balancing entity “d”, within the scope of balancing electricity market that is equal to 1 when the balancing entity has a consumption facility and that is equal to 0 in all other cases.

Determination of accepted bid volumes for bids accepted within the context of balancing power market

ARTICLE 12 - (1) The bid volumes to be applied to each balancing entity within the context of balancing electricity market for an invoicing period, in connection with the down-regulation instructions given for each settlement period, shall be calculated according to the following formula:

$$AFBV_{d,u,r} = \frac{DRIV_{d,u,r}}{(1 - ASLF_u)^g} \times (t_2 - t_1) / 60$$

(2) where;

- AFBV_{d,u,r} is the accepted and fulfilled bid volume (MWh) of bid "r" of balancing entity "d", within the context of balancing electricity market, valid for the settlement period "u",
- DRIV_{d,u,r} is the down-regulation instruction volume (MWh) given by the Transmission System Operator regarding bid "r" of balancing entity "d", within the context of balancing power market, valid for the settlement period "u",
- TSLF_u is Transmission System Loss Factor for settlement period "u",
- t₁ is the start time of down-regulation instruction issued by the System Operator regarding bid "r" of balancing entity "d", within the context of balancing power market, valid for the settlement period "u",
- t₂ is the end time of down-regulation instruction issued by the Transmission System Operator regarding bid "r" of balancing entity "d", within the context of balancing power market, valid for the settlement period "u".
- g is the tag value of the balancing entity "d", within the scope of balancing electricity market that is equal to 1 when the balancing entity has a consumption facility and that is equal to 0 in all other cases.

Section Four

Rules on Metering Data

ARTICLE 13. Scope

(1) These rules regulate:

- a) Usage of Metering Data and devices, information system and mechanisms in the process of settlement in the electricity wholesale market;
- b) How the Metering Data (including voltage and current transformation coefficients) should be taken from Eligible Enterprises, organized and handled in order to enable MO to fulfill its responsibilities for settlement purposes;
- c) Aggregation, Verification and Approval of the metered values;
- d) Calculation, submission, verification and approval of billed, received and consumed electricity volumes by Eligible Enterprises.

(2) The aggregation of data for the electricity metering shall serve the processes of settlement of the quantities traded on the electricity through bilateral (direct) contracts, the balancing electricity market, the cross border exchanges, the settlement of the imbalances and the ancillary services.

(3) The process of settlement on the electricity market shall be based on a settlement period that is based on calculation period¹.

ARTICLE 14. Responsible Parties

(1) Market Operator

- Establishes and manages the electricity wholesale market metering database, to which full access has TSO, while Qualified Enterprises can access only to the information related to them.

(2) Transmission System Operator

- Receives Metering Data from the meters that are registered to the electricity wholesale market metering database;
- In automatic mode provides raw² data to MO for settlement purposes;
- Establishes and manages the metering database in its control area.

(3) Distribution System Operators

- Establishes and maintains the Metering Database in its control area;
- Receives Metering Data from Tariff Customers from Eligible Enterprises connected to its own grid;
- Validates and feeds the Metering Data in the Metering Database;
- Provides approved or substituted Metering Data to the MO and TSO.

(4) Market Participants

- Market participants are responsible for making metering equipment available to MO and TSO;
- Establishes and maintains the Metering Database in its control area.

ARTICLE 15. Metering Data Collection

(1) Qualified Enterprises must be capable of electronic and remote communication with that system operator's meter interrogation system ("Alpha Center") to which it is connected physically³. Transfer of metering data shall be done in time intervals as it is defined by the rules.

(2) Metering equipment shall meet requirements defined by relevant Grid Codes.

(3) If remote acquisition of metering data becomes unavailable, corresponding Qualified Enterprise should contact to the TSO to arrange an alternate means of transferring the data.

(4) The raw metering data collected by the TSO, before transferring to MO, are checked. Process of checking metered values consists by three main stages:

¹ According to the Working Group discussions, sum of the calculation periods equals to the settlement period.

Settlement period should be one month; calculation period can be 1 hour or 1 day (WG could not decide) and should be defined by the Market Rules.

² GSE does not agree to send only raw data to MO.

³ GSE disagrees, instead it suggests: ... to which it is connected physically or to TSO

- a) Estimation of the received meter values;
 - b) Editing non-adequate data values using corresponding methodology;
 - c) Validation of the data (including edited ones).
- (5) The metering data recorded in the metering database with respect to a registered commercial meter is confidential information and will only be made available to:
- the Qualified Enterprise whose consumed or generated electricity is metered by corresponding meter;
 - the owner of the transmission or distribution network whose transmitted or distributed electricity is metered by corresponding meter;
 - to the MO.
- (6) Qualified Enterprises are entitled to request detailed reports from the Metering Database not later than five (5) working days after the end of the Settlement period (month). In case of a dispute regarding the Metering Data, a Qualified Enterprise has right to appeal accuracy of the Metered Data until the ninth (9) working day after the end of the Settlement month.

ARTICLE 16. Requirements for the metering systems

- (1) Electricity metering devices for metering shall be installed at all metering points according to the Grid Codes;
- (2) The owners of metering systems shall store minimum 10 years⁴ and per request of MO or TSO submit aggregated metered values from the electricity metering devices for the electricity that has been delivered/consumed to/from the installations of Qualified Enterprises for each settlement period.
- (3) Each virtual electricity metering device shall have alphanumeric identification code. These codes shall be determined by the MO at the registration of the Qualified Enterprise and shall be provided to the relevant owners of metering systems together with a list of the metering points for each identification code.
- (4) A Qualified Enterprise shall provide information on all metering points of the installations indicated by him at registration. Registration of installation of a Qualified Enterprise on the electricity market with incomplete list of the metering points for the relevant installation shall not be allowed.
- (5) During the registration of Qualified Enterprises, the meters of these entities shall be registered with MO.
- (6) The meters that are not approved by the requirements defined for the metering system in the Grid Code shall not be registered.
- (7) Necessary test procedures for the metering system to be pursuant by the MO should be in accordance to the relevant Grid Code.

ARTICLE 17. Metering and certification of the metered quantities

⁴ GSE suggests do not specify time interval.

(1) The metered value shall represent the quantity electricity that is metered, calculated and accepted as registered by an electricity metering device for periodically metering or/and through load profile integrated for the settlement period.

(2) Each owner of the metering system shall be responsible for the reading of all metered values according to the Electricity Market Rules and relevant Grid Code.

(3) In case of missing hourly data from separate metering systems Market Operator uses values that were recorded from similar calculation period of the last settlement period, or applies to other methods that are determined in the transmission/distribution network connection agreement of the relevant Qualified Enterprise. This agreement should be submitted also to MO for registering since it covers issues related to the metering database⁵.

(4) The values that are metered according to this article shall be sent to TSO and Qualified Enterprises by MO, within four (4) calendar days following the end of settlement period.

(5) metered values received can be appealed by the market participants within three (3) working days after receiving the statement of metered volumes. The owner of the metering devices shall implement an examination and shall confirm or correct the metered values within three (3) working days after receiving the statement of metered volumes. In case TSO or Qualified Enterprise disagree notified values, grounded appeal in a written form shall be sent to MO within this deadline. Values which are not appealed within this deadline shall be considered confirmed.

(6) All metered values including these that were subject to examination, according to (4), shall be considered by the Market Operator as confirmed by the parties not later than the ninth (9) day of each calendar month following the month of settlement and shall be considered as confirmed metered values. In case the agreement between the parties is not reached after this date, the dispute shall be settled according to this rules not later than the twelfth (12) day of each calendar month following the month of settlement.

(7) The provisions of this section shall be applicable also for the metering points which correspond to installations of producers and consumers who provide ancillary services to the Transmission System Operator⁶.

ARTICLE 18. Aggregation and submission of the metered values

(1) After determination of the confirmed metered value the MO shall determine the total physical deliveries of electricity for each producer and each consumer/supplier of end consumer (as appropriate), for the relevant network for each settlement period.

⁵ GSE prefers initial version of the paragraph, that says: "In case of missing hourly data from separate metering systems and with the purpose to meet the deadlines for submission of information to Market Operator, the TSO can use replacing values calculated on the basis of preceding settlement periods or otherwise as specified in the contract for access to the distribution /transmission network of the market participant".

⁶ ESCO suggested to change paragraph 7 in a following way "The provisions of this section shall be applicable also for metering ancillary services that are provided to TSO"

- (2) The total generation of a producer shall be equal to the sum of all metered values taken from registered meters of the relevant generators.
- (3) The total consumption of a consumer shall be equal to the difference between received and supplied electricity quantities that are metered at the relevant connection points by registered metering points.
- (4) The net supply to the network shall be equal to the amount of the total generation of all producers connected to this network.
- (5) The net consumption from the relevant network shall be equal to the amount of the total consumption of all consumers of this network.
- (6) The electricity provided to or received from neighboring electricity systems via cross-border transmission lines shall be equal to the sum of all metered values that are taken from registered meters on the relevant transmission lines.
- (8) The TSO shall submit to the Market Operator validated data from the commercial electricity meters⁷.

ARTICLE 19. Determination of the technological losses in the network

- (1) All metered values from the commercial electricity metering devices, including metered values from the metering devices between the separate transmission networks, shall be metered and used in the determination of the network technological losses of the transmission and the distribution licensees.
- (2) The technological losses in the network shall be determined separately for the electricity transmission network and each electricity distribution network, based on the metered values from the registered meters.
- (3) The TSO in accordance with the ownership (or managing) of the network for which it is responsible, shall determine the technological losses in the relevant network for each calculation period as the difference between the overall electricity quantity produced in the relevant network at the metering points and the electricity quantity consumed in the relevant network or supplied in other networks, according to the confirmed metered values.
- (4) The MO shall calculate the imbalances on the basis of the determined technological losses under paragraph 3 for coverage of the technological losses.
- (5) The owners of networks (licensees) shall develop and present to GNERC "Methods for calculation of technological losses in the network". GNERC approves methodologies for calculation of technological losses in the network separately for each network.
- (6) The methods approved by GNERC shall be applied by the MO in the calculation of the imbalances from technological losses of the Qualified Enterprises.
- (7) All technological losses in the networks, determined under paragraph 5, shall be considered as confirmed metered values.

ARTICLE 20. Usage of metered values as in regards to the implementation of the activity „Imbalances settlement“ by the MO.

⁷ ESCO does not agree to the statement.

- (1) TSO shall identify physical imbalances in the system and provide the following information to MO related to:
- the confirmed metered values separately for all market participant/entities that shall provide information on ancillary services;
 - technological losses in the network;
 - net generation and net consumption in the transmission network;
 - Exported electricity quantity;
 - Exported electricity quantity;
- (2) In case TSO will not provide information before the determined deadline to MO, the latter independently will determine information specified under paragraph (1) based on Alpha-Center data.
- (3) The Market Operator shall implement final physical settlement for each Qualified Enterprise until the tenth day of each calendar month following the month of the metering devices reading.
- (3) The Market Operator shall implement financial settlement on a monthly basis of each Qualified Enterprise, in accordance with the Balancing and Settlement Rules.

4. Annex C: USAID Version of Electricity Market Balancing and Settlement Rules

Balancing and Settlement Rules will be a key part of the Market Regulations for the electricity market in Georgia

The Balancing and Settlement Rules hereinafter referred to as the "Rules", regulate:

1. General provisions and definitions of preliminary terms in the electricity market;
2. Rules for the Day-ahead planning (DAP) process;
3. Rules of the balancing electricity market;
4. Rules for conclusion of transactions for electricity at regulated and freely negotiated prices through bilateral contracts;
5. Rules for conclusion of transactions on the Day-ahead market (DAM);
6. Rules for registration of balance responsible parties, suppliers of ancillary services and balancing electricity providers;
7. Procedures for registration of hourly schedules and settlement between the market participants and the Market Operator (MO);
8. Requirements for the submission of data for the metered quantities of electricity to the MO and balance responsible parties;
9. Requirements for data exchange between the market participants;

10. Rules for settlement, the principles of balancing and the methods for balancing energy price determination;
11. Electricity market monitoring;
12. Procedures for implementing amendments in the rules.

Chapter I

General Provisions and Definitions of Preliminary Terms in the Electricity Market

Objective

ARTICLE 1 – (1) The objective of these Rules is to set forth the principles and procedures regarding balancing of the active electricity demand and supply and settlement.

Scope

ARTICLE 2 - (1) These rules cover duties, powers and responsibilities of the parties involved in balancing mechanism and settlement, and the principles and procedures applicable to the balancing of active electricity supply and demand as well as the financial settlement of the credits and debits of licensees arising from participation in balancing mechanism and settlement.

Legal Basis

ARTICLE 3 - (1) These Rules have been prepared based on Georgian Law on Electricity and Natural Gas.

Definitions

ARTICLE 4 - (1) For the purposes of these Rules, the following terms shall bear the following meanings:

Transmission System Operator (TSO): A centralized institution, which is responsible for ensuring the safe and reliable operation of the overall power system.

1. Automatic Meter Reading System (AMRS): The system which will be installed by Transmission System Operator and distribution license holder legal entities, and which will cover the required software, hardware and communication infrastructure for automatic remote reading of meter data, transferring data to a central system, validating, filling the missing data and submitting them to the relevant parties in the desired format.
2. Distribution Region: The region defined in a distribution license.
3. Distribution Licensee: distribution license holder companies and distribution license holder legal entities.
4. Distribution System: The electricity distribution facilities and grid which a distribution company operates and/or owns in its designated region.

5. Market Operator (MO): A centralized institution, which operates an organized wholesale market for the (commercial) exchange of energy or other products on behalf of market participants.
6. Balance Responsible Group: The group formed by notification to Market Operator by market participants and in which one participant among group undertakes the obligations regarding balance responsibility on behalf of the group.
7. Balance Responsible Party: The market participant that takes over, on behalf of the balance responsible group, the financial liability against the Market Operator for the energy imbalance of the balance responsible group or that is not part of any balance responsible group.
8. Balancing: The activities performed to ensure balance between electricity demand and supply.
9. Balancing Entity: Generation or consumption facility or part of the generation or consumption facility eligible to participate in the balancing electricity market.
10. Balancing Power Market: The organized wholesale electricity market, which is operated by the Transmission System Operator and Market Operator and where the reserve capacity, is sold or purchased, to serve the purpose of real-time balancing of demand and supply.
11. Balancing Mechanism: The activities which complement bilateral contracts and which consist of day ahead balancing and real-time balancing.
12. Bilateral Contracts: Contracts for the exchange of electricity (energy) that are directly concluded between two market participants. Bilateral contracts may take the form of either physical or financial contracts.
13. Block Sales Bid: Active electricity sales bids that are valid for more than one consecutive hour for the next day, including average price and average quantity information for the time interval it spans and submitted by market participants that participate to the day ahead market.
14. ENTSO: European Network of Electricity Transmission System Operators.
15. Invoicing Period: The period begins at 00:00 hours on the first day of a calendar month and ends at 24:00 hours on the last day of that month.
16. Real-time Balancing: The actions carried out by the System Operator in order to balance the supply and demand of active electricity energy in real-time.
17. Day Ahead Planning: The actions carried out under the coordination of Market Operator in order to balance the foreseen hourly demand regarding the following day on the day ahead, until when Day ahead market will be initiated.
18. Day Ahead Generation/Consumption Schedule (DGS): The hourly generation or consumption values with respect to settlement delivery point which a settlement aggregation entity anticipates to realize in the following day and notifies the Market Operator at the beginning of day ahead balancing stage, according to the obligations of the balance responsible party to which it is attached.
19. Day Ahead Balancing: The activities regarding day ahead planning or day ahead market intended to ensure the day ahead balancing of supply and demand in the

system, as well as balancing of the contractual commitments and generation and/or consumption plans of market participants.

20. Day Ahead Price: The system marginal prices determined under day ahead planning or the final market clearing price determined in the Day ahead market.
21. Day Ahead Market: The organized wholesale electricity market established for purchase and sale transactions of electricity to be delivered in the day ahead on the basis of settlement period and that is operated by the Market Operator.
22. Day Ahead Market Price: Final market clearing price.
23. Day Ahead Market Participation Agreement: The standard agreement including requirements and rules about market participant's attendance to Day ahead market and management of the day ahead market by the Market Operator.
24. Day Ahead Market Bids: Single hour purchase and sales bids, block purchase and sales bids and flexible sales bids that are submitted by market participants that participate in Day Ahead Market.
25. Distribution system operator (DSO): A legal entity responsible for operating, ensuring the maintenance of and, if necessary, developing the distribution system in a given area and, where applicable, its interconnections with other systems and for ensuring the long-term ability of the system to meet reasonable demands for the distribution of electricity.
26. Market Management System (MMS): The applications that are working as thin client aimed at executing the balancing mechanism and settlement transactions and accessible by the Market Operator, the Transmission System Operator, market participants and transmission and distribution license holder legal entities.
27. Day Ahead Planning Module: The software module that takes place in the context of MMS and used by the Market Operator and the Transmission System Operator within the framework of day ahead planning in order to determine system marginal prices and prepare Day ahead schedule such that balancing costs will be minimized.
28. Day Ahead Schedule: The national scale generation/consumption schedule prepared for the following day, as a result of day ahead balancing activities.
29. Day Ahead System Sales Bids: The hourly, block and flexible sales bids submitted within the framework of day ahead balancing activities.
30. Day Ahead System Purchase Bids: The hourly and block purchase bids submitted within the framework of day ahead balancing activities.
31. Flexible Sales Bid: Single hour active electricity sales bids submitted by market participants that participate to the day ahead balancing activities for the next day but that is not related to a certain hour.
32. Transmission: The transport of electricity through high voltage electricity lines as defined in Georgian Law on Electricity and Natural Gas.
33. Transmission Capacity: The amount of electric power that can be sent / received from any point of the transmission system, as expressed in megawatt (MW) terms.
34. Transmission System: Electricity transmission facilities and network.

35. Transmission System Configuration: Calculation rules that includes information such as the meters, which will be considered in order to calculate the electricity supplied to a transmission system or electricity withdrawn from the transmission system and, direction of the meters in terms of supply and withdraw, loss coefficient that will be applied to meters.
36. Relevant Legislation: The laws, regulations, communiqués, circulars and Board decisions regarding the electricity market as well as licenses held by the relevant legal entities.
37. Law: Georgian Law on Electricity and Natural Gas
38. Final Day Ahead Generation/Consumption Schedule (FDGS): The hourly generation or consumption values which a settlement aggregation entity anticipates to realize in the following day and notifies the Transmission System Operator at the opening of the balancing power market according to the obligations of the balance responsible party to which it is attached and the result of day ahead balancing.
39. Congestion Management: The methods used for the elimination of any congestion that has arisen or is foreseen to arise in the transmission system.
40. Central Settlement Bank: Bank used by the Market Operator and market participants for carrying out operations regarding payments and collaterals within the scope of this Regulation.
41. Central Settlement Bank Agreement: Agreement that will be signed between Market Operator and central settlement bank and that consists of duties and responsibilities of the parties regarding collateral management and payments.
42. Central Settlement Bank – Market Participant Agreement: Agreement that will be prepared by the Market Operator and will be signed between market participants and central settlement bank, with regard to collateral management and cash payment services.
43. Organized Wholesale Electricity Market: Electricity markets such as Day ahead market, balancing power market, ancillary services market, operated by the Market Operator and/or the Transmission System Operator where wholesale trade of electricity energy, capacity or derivatives takes place.
44. Market Participation Agreement: The standard agreement covering the provisions and conditions regarding the operation of balancing mechanism by the Market Operator and System Operator and the participation of the market participant in the balancing mechanism excluding Day Ahead Market.
45. Market Participant: entities that operate in a competitive environment and that are active in the electricity market to either buy or sell electricity for commercial purposes.
46. System: Electricity transmission system and distribution systems.
47. System Purchase Bid Volume: The volumes of decrease in generation or increase in consumption, which market participants participating in Day ahead balancing activities propose to undertake in the related balancing entity.

48. System Purchase Instruction: The notifications issued by the Transmission System Operator or Market Operator to the related market participants, for purchase or sell of the market participants participating in day ahead planning.
49. System Imbalance Price: The price applied for the electricity imbalances of market participants arising from their balance responsibilities as determined for each settlement period.
50. Demand Forecast: The hourly consumption forecasts published on a daily basis by the Transmission System Operator.
51. Instruction: Up-regulation or down-regulation instruction.
52. Consumption: Electricity consumption.
53. Consumption Unit: Facilities where electricity is consumed.
54. Settlement: The activities of calculating the amounts payable and receivable due to balancing mechanism and/or energy imbalances and of preparing the related payable-receivable notices.
55. Settlement Period: The periods taken as a basis for settlement transactions.
56. Settlement Delivery Point: Transmission system connection point where consumption or export from the transmission system occurs and that is subject to transmission system loss.
57. Settlement Volume: The value regarding the reading on the basis of active electricity energy settlement delivery point, which is taken from meters in the settlement aggregation entity configuration to be used as a basis in the settlement calculations.
58. Entity: Generation or consumption facility or part of the generation or consumption facility eligible to participate in the market.
59. Generation: The transformation of energy resources into electricity energy in generation facilities.
60. Tariff Customers: Electricity consumers that are connected to a Distribution System and purchase electricity from their RPSs at rates regulated by the Georgian National Energy and Water Supply Regulatory Commission (GNERC).
61. Retail Public Suppliers (RPSs): Legal entity that supplies electricity only to Tariff Customers under tariffs and pursuant to contracts that have been approved by the GNERC.
62. Generation Facility: The facilities where electricity energy is generated.
63. Ancillary Services: System services those are essential for the proper functioning of the Transmission Grid.
64. Up-regulation: The situation where a balancing entity sells electricity to the system by increasing its generation or decreasing its consumption, in line with the instructions issued by the Transmission System Operator.
65. Up-regulation Instruction: The notifications issued by the Transmission System Operator or Market Operator to the related market participants, for up-regulation of the market participants participating in balancing power market.

66. Down-regulation: The situation where a balancing entity buys energy from the system by decreasing its generation or increasing its consumption, in line with the instructions issued by System Operator.
67. Down-regulation Instruction: The notifications issued by the System Operator or Market Operator to the related market participants, for down-regulation of the market participants participating in balancing power market.

Chapter II

Draft Interim Rules for Day-ahead Planning

Section One

General Provisions

Principles of day ahead planning

ARTICLE 5 – (1) Day ahead planning shall be executed according to the provisions of these Rules, with due regard also to the Transmission Code such that the foreseen hourly demand for the day ahead will be balanced while

- a) ensuring operational security and system integrity,
- b) satisfying supply security and supply quality criteria,
- c) minimizing balancing costs for the Transmission System Operator.

(2) Transactions related to the day ahead planning are executed on the basis of below principles:

- a) All market participants shall participate in day ahead planning;
- b) Day-ahead planning transactions are executed daily on an hourly basis. Each day consists of time intervals starting at 00:00 and ending next day at 00:00.

Section Two

DAP procedures regarding generation, consumption and trade scheduling

Generation and consumption schedules

ARTICLE 6. (1) Day ahead planning shall be executed on a daily basis and shall consist of the following steps:

- (13) Day ahead generation schedules shall be sent to the Market Operator by all producers, connected to the transmission network, before 10:00 hour on the day, preceding the Delivery day, and shall contain information for the gross and net generation of the plant including bilaterally contracted volumes and planned sales to the system.
- (14) The import - export schedule for cross-border exchange shall be sent before 10:00 hour of each day to the Transmission System Operator in a single file with a standard form, approved by the Transmission System Operator, and shall contain information on the quantities of electricity for each hour of the Delivery Day.

- (15) Until 10:00 hours each day, all market participants shall notify Market Operator via MMS regarding total consumption forecasts for each hour of the following day concerning consumption units registered under each market participant including bilaterally contracted volumes and planned purchase from the system.
- (16) By 10:00 hours each day, the Transmission System Operator shall announce the demand forecast and possible system congestions for the following day via MMS.
- (17) The demand forecast announced by the Transmission System Operator shall contain information on total demand (MWh) to be met by all generation facilities in the system for each hour between 00:00 and 24:00 hours on the day that follows the day of announcement.
- (18) Between 10:00 and 11:30 hours each day the Market Operator shall prepare the non-constrained generation/consumption schedule that will balance the forecast hourly demand, for each hour of the day ahead, via the day ahead planning module of MMS. The hourly consumption schedules shall contain information on the planned consumption, according to the concluded contracts and the procedures, provided in the Transmission Grid Code and these Rules and shall be sent within the specified schedule.
- (19) Between 11:30 and 12:30 hours each day; the market participants participating in day ahead planning shall check whether or not the system instructions issued by the Market Operator for day ahead planning are consistent with the related system load, and may object to the Market Operator regarding inconsistent instructions.
- (20) Between 12:30 and 13:00 hours each day; the Market Operator shall evaluate the objections and if necessary, re-determine the day ahead planning, to the related market participants.
- (21) Until 13:00 hours of each day the Market Operator shall conclude the final day ahead planning schedule.
- (22) Between 13:00 and 15:00 hour of each day and the Transmission System Operator (TSO), on the basis of the generation schedules and the consumption schedules and his own demand forecast, defined in paragraphs (6) and (5) correspondingly, shall determine the required primary, secondary, and contingency reserve for the next day, necessary for:
- supporting the balance between the generation and the consumption in real time;
 - ensuring a secure and reliable electricity supply;
 - maintaining reserve capacity in the cases of unplanned emergency situations in the network and the generation capacities and changes in the climate conditions;
 - congestion management.
- (23) By 15:30 hour each day, MO announces Final Hourly Generation\Consumption Schedule, for the next day, based on TSO's modifications.

(24) The confirmed by the Market Operator export-import schedules, generation schedules and consumption schedules, including system sales and purchases, shall present the basis for determination of the imbalances of the market participants.

Section Three

Calculations of hourly imbalances for each market Participants

Calculation of the energy imbalance volume of a balance responsible party in a settlement period

ARTICLE 7 - (1) The subject of settlement's imbalance for every trading hour is, a sum of differences between actually supplied and contracted volumes of electricity for electricity supply and of difference between actually consumed and contracted volumes of electricity for electricity consumption.

For an invoicing period, the energy imbalance volume of each market participant in each settlement period shall be calculated according to the following formula:

$$EIV_{p,u} = \sum_{b=1}^k (PSSV_{p,b,u} - PSWV_{p,b,u}) + CV_{p,u} - FEIV_{p,u} + \left(\sum_{r=1}^m SSV_{p,u,r} - \sum_{r=1}^n SPV_{p,u,r} \right) + \left(\sum_{r=1}^{12} AFOV_{d,u,r} - \sum_{r=1}^{11} AFBV_{d,u,r} \right)$$

(2) where;

$EIV_{p,t,u}$ is the Energy Imbalance Volume (MWh) for the settlement period "u" of market participant "p",

$PSSV_{p,b,u}$ is the Settlement Supply Volume (MWh) for settlement period "u" of settlement aggregation entity "b" within the context of the balance responsibility of a market participant "p", which is calculated pursuant to Article 8,

$PSWV_{p,b,u}$ is the Settlement Withdrawal Volume (MWh) for settlement period "u" of settlement aggregation entity "b" within the context of the balance responsibility of a market participant "p", that equals to the withdrawal volume from the transmission system, or net withdrawal volume from distribution system,

$CV_{p,u}$ is the Contract Volume (MWh) of a market participant "p", in settlement period "u", which is calculated pursuant to Article 9,

FEIV _{p,u}	is the Foreseen Energy Imbalance Volume (MWh) of the market participant “p”, anticipated from the day ahead for the settlement period “u” which is calculated as part of day ahead planning pursuant to Article 10,
SSV _{p,u,r}	is the System Sales Volume (MWh) of market participant “p” under its offer “r” valid for settlement period “u”, determined after day ahead planning,
SPV _{p,u,r}	is the System Purchase Volume (MWh) of market participant “p” under its bid “r” valid for settlement period “u”,
k	is the number of settlement aggregation entities under the balance responsibility of market participant “p” valid for the settlement period “u”,
n	is the number of bids/offers under which market participant “p” has sold to the system valid for the settlement period “u”,
m	is the number of bids/offers under which market participant “p” has purchased from the system valid for the settlement period “u”,
AFOV _{d,u,r}	is the accepted and fulfilled offer volume (MWh) of the offer “r” of balancing entity “d”, valid for the settlement period “u”, calculated pursuant to article 11,
t1	is the number of accepted offers of balancing entity “d” in the balancing power market, for the settlement period “u”,
AFBV _{d,u,r}	is the accepted and fulfilled bid volume (MWh) of the bid “r” of balancing entity “d”, valid for the settlement period “u”, calculated pursuant to article 12
t2	is the number of accepted bids of balancing entity “d” in the balancing power market, for the settlement period “u”.

Calculation of settlement volumes

ARTICLE 8 - (1) The settlement volumes of settlement aggregation entities shall be calculated according to the following formula:

$$PSSV_{b,u} = TSSV_{b,u} \times (1 - TSLF_u)^9$$

(2) where;

- UEVM_{b,u} is the Settlement Supply Volume (MWh) of Settlement Aggregation Entity “b” for settlement period “u”,
- TSSV_{b,u} is the Supply Volume (MWh) of Settlement Aggregation Entity “b” to transmission system for settlement period “u”,
- TSLF_u Transmission System Loss Factor for settlement period “u”,
- g is the tag value of settlement aggregation entity “b” is equal to 1 in case the entity is a generation facility connected to the transmission system and 0 in all other cases.

Calculation of the contract volumes

ARTICLE 9 - (1) Contract volumes of a market participant “p” for the settlement period “u” shall be calculated according to the following formula:

$$CV_{p,u} = \sum_{z2=1}^m CNS_{p,u,z2} - \sum_{z1=1}^n CNS_{p,u,z1}$$

(2) where;

- CV_{p,u} is the Contract Volume (MWh) of the market participant “p”, for the settlement period “u”,
- CNS_{p,u,z2} is the Contract Notification (MWh) of the market participant “p” for electricity sales to market participant “z1” in settlement period “u”, and/or regarding the generation provided as per the ancillary services, whose electricity cost is paid within context of ancillary services,
- CNS_{p,u,z2} is the Contract Notification (MWh) regarding market participant “p”, which is made for energy purchase from the market participant “z2” in settlement period “u”,
- n is the number of market participants to which the market participant “p” sells electricity, in settlement period “u”,
- m is the number of market participants from which the market participant “p” purchases electricity, in settlement period “u”.

Calculation of foreseen Day-ahead imbalance volume in the day ahead planning process

ARTICLE 10 - (1) For a particular invoicing period on settlement period basis the foreseen day ahead imbalance volume amount for every market participant participating in the day ahead planning is calculated according to following formula:

$$FEIV_{p,u} = DAGS_{p,u} + CV_{p,u}$$

(2) where;

- $FEIV_{p,u}$ is the Foreseen Day Ahead Electricity Imbalance Volume (MWh) of market participant “p” regarding settlement period “u”,
- $DAGS_{p,u}$ is the Day Ahead Generation/Consumption Schedule (MWh) submitted by market participant “p” to the Market Operator for settlement period “u”, that has positive value for supply to the system and negative value for withdrawal from the system,
- $CV_{p,u}$ is the Contract Volume (MWh) of market participant “p” for settlement period “u” that is calculated pursuant to Article 9,

Determination of accepted offer volumes for offers accepted within the context of balancing electricity market

ARTICLE 11 - (1) The accepted offer volumes to be applied to each balancing entity within the context of balancing electricity market for an invoicing period, in connection with the up-regulation instructions issued for each settlement period, shall be calculated according to the following formula:

$$AFOV_{d,u,r} = URIV_{d,u,r} \times (1 - TSLF_u)^g \times (t_2 - t_1) / 60$$

(2) where;

- $AFOV_{d,u,r}$ is the accepted and fulfilled offer volume (MWh) within the context of balancing electricity market, regarding the offer “r” of balancing entity “d”, which is valid for the settlement period “u”,
- $URIV_{d,u,r}$ is the up-regulation instruction volume (MWh) given by the System Operator and realized regarding offer “r” of balancing entity “d”, within the context of balancing electricity market, valid for the settlement period “u”,
- $TSLF_u$ is Transmission System Loss Factor for settlement period “u”,
- t_1 is the start time of up-regulation instruction as hour and minutes, given by the System Operator regarding offer “r” of balancing entity “d”, within the context of balancing electricity market, valid for the settlement period “u”,

- t_2 is the end of up-regulation instruction as hour and minutes, issued by the System Operator regarding offer “r” of balancing entity “d”, within the context of balancing electricity market, valid for the settlement period “u”.
- g is the tag value of the of balancing entity “d”, within the scope of balancing electricity market that is equal to 1 when the balancing entity has a generation facility connected to the transmission system and that is equal to 0 in all other cases.

Determination of accepted bid volumes for bids accepted within the context of balancing power market

ARTICLE 12 - (1) The bid volumes to be applied to each balancing entity within the context of balancing electricity market for an invoicing period, in connection with the down-regulation instructions given for each settlement period, shall be calculated according to the following formula:

$$AFBV_{d,u,r} = DRIV_{d,u,r} \times (1 - TSLF_u)^g \times (t_2 - t_1) / 60$$

(2) where;

- $AFBV_{d,u,r}$ is the accepted and fulfilled bid volume (MWh) of bid “r” of balancing entity “d”, within the context of balancing electricity market, valid for the settlement period “u”,
- $DRIV_{d,u,r}$ is the down-regulation instruction volume (MWh) given by the Transmission System Operator regarding bid “r” of balancing entity “d”, within the context of balancing power market, valid for the settlement period “u”,
- $TSLF_u$ is Transmission System Loss Factor for settlement period “u”,
- t_1 is the start time of down-regulation instruction issued by the System Operator regarding bid “r” of balancing entity “d”, within the context of balancing power market, valid for the settlement period “u”,
- t_2 is the end time of down-regulation instruction issued by the Transmission System Operator regarding bid “r” of balancing entity “d”, within the context of balancing power market, valid for the settlement period “u”.
- g is the tag value of the of balancing entity “d”, within the scope of balancing electricity market that is equal to 1 when the balancing entity has a generation facility connected to the transmission system and that is equal to 0 in all other cases.

Section Four

Rules on Metering Data

ARTICLE 13. Scope

(1) These rules provide information how the Metering Data should be taken from Market Participants organized and handled in order to enable MO to fulfill its responsibilities for settlement as it is defined in the License for the MO issued by the GNERC. The terms that are not defined in these Rules are defined in the Transmission Grid Code.

(2) The aggregation and the provision of data for the electricity metering shall serve the processes of settlement of the quantities traded on the electricity through bilateral contracts, the balancing electricity market, the cross border exchanges, the settlement of the imbalances and the ancillary services.

(3) This Article regulates the procedures for:

1. Aggregation of the metered values;
2. Submission of the total metered values;
3. Verification of data;
4. Approval of data by market participants.

(4) The process of settlement on the electricity market shall be based on a settlement period and all aggregated and submitted values of the load profile shall be for the same interval of time.

(5) These Rules regulate the usage of metering devices information systems and mechanisms in the process of settlement on the electricity market. These Rules are not applicable to metering equipment and facilities that are for operational purpose (SCADA, etc.).

ARTICLE 14. Responsible Parties

(5) Market Operator

- Will develop rules for the aggregation of metering data leading in order to meet the requirements for the billing process.
- Will make these metering rules available to metering operators on Transmission and Distribution network that are requested to deliver metering data by the Market Rules and Transmission Grid Code and Distribution Grid Code.

(6) Transmission System Operator

- Establishes and maintains the Metering Database.
- Receives Metering Data from the network operators on Distribution and Transmission network.
- Validates and feeds the Metering Data in the Metering Database.
- Provides approved, aggregated or substituted (if necessary) Metering Data to the MO for Settlement and Invoicing purposes, on daily and monthly basis (aggregately).

(7) Distribution System Operators

- Establishes and maintains the Metering Database in its control area.
- Receives Metering Data from Tariff Customers through the Retail Public Suppliers and from Eligible Customers.
- Validates and feeds the Metering Data in the Metering Database.
- Provides approved, aggregated or substituted Metering Data to the MO and TSO.

(8) Market Participants

- Market participants are responsible for making metering equipment available to TSO

Main steps, timelines and responsibilities are provided in the table below:

Actions/ Documents	Trading Party S=Sent R=Receive	MO S=Sent R=Receive	TSO S=Sent R=Receive	Timeframe Business days after end of the Settlement Month
Collect and aggregate meter readings			R	Every day (d)
Transfer approved metering data		R	S	Every day (d)
Statement of metering volumes	R	S		5 th day after the end of the Settlement Month
Queries regarding metering volumes	S	R		6-9 th day after the end of the Settlement Month
Approved metering data for invoicing	R	S		10 th day after the end of the Settlement Month

ARTICLE 15. Metering Data Collection

(1) Energy generation and energy consumption for all Market Participants shall be electronically metered and must be capable of electronic and remote communication with TSO’s meter interrogation system (“Alpha Center”) in order to transfer metering data in time intervals defined by the Transmission Grid Code.

(2) All metering equipment’s shall meet at least the minimum requirements defined by the Transmission and Distribution Grid Codes.

(3) Metered volumes should be read remotely. Metered volume of embedded generation connected to distribution network shall be provided to TSO via DSO “Alpha Center” on real time basis.

(4) If remote acquisition of metering data becomes unavailable, the TSO will contact the metered market participant or metering service provider to arrange an alternate means of transferring the data.

(5) The raw metering data collected by the TSO, before transferring to MO, are checked using the estimation, editing and validation process, results in validated and estimated metering data suitable for use in determining settlement amounts. This allows errors to be

detected in the metering data resulting from improper operational conditions and/or hardware/software malfunctions, including failures of, or errors in, metering or communication hardware, and from metering data exceeding pre-defined variances or tolerances. All validation tests are performed automatically by the metering data analysis software at the "Alpha Center".

(6) The metering data recorded in the metering database with respect to a registered commercial meter is confidential information and will only be made available to:

- the metered market participant for that registered commercial meter;
- the metering service provider for that registered wholesale meter (TSO, TRANSCO, DSO);
- any market participant whose settlement statement is determined on the basis of the metering data recorded in that registered commercial meter;
- in addition, metered market participants may authorize other market participants to access their specific delivery point data.

(7) Market Participants are entitled to request details from the Metering Database not later than five (5) working days after the end of the Settlement period (month). In case of a dispute regarding the Metering Data, a Market Participant shall send a written Request for Dispute of Metered Data per post, fax or Email to the MO until the ninth (9) working day after the end of the Settlement month. The Request for Dispute of Metered Volumes shall at least contain:

- (a) Disputed time frame;
- (b) Specifications of the Disputed Metering System(s).

ARTICLE 16. Requirements for the metering systems

(1) Electricity metering devices for metering shall be installed at all metering points according to the Transmission Grid Code;

(2) The owners of metering systems shall store and submit aggregated metered values from the electricity metering devices for the electricity that has been delivered/consumed to/from the installations of trade participants for each settlement period.

(3) Each virtual electricity metering device shall have alphanumeric identification code. These codes shall be determined by the TSO at the registration of the market participant and shall be provided to the relevant owners of metering systems together with a list of the metering points for each identification code.

(4) A market participant shall provide all metering points of the installations indicated by him at registration. Registration of installation of a trade participant on the electricity market with incomplete list of the metering points for the relevant installation shall not be allowed.

(5) During the registration of Market Participants, the meters of these entities shall also be registered with TSO.

(6) The meters that are not approved by the requirements defined for the metering system in the Transmission Grid Code shall not be registered.

(7) Necessary test procedures for the metering system communication to be pursuant by the TSO should be in accordance to the Transmission Grid Code.

ARTICLE 17. Metering and certification of the metered quantities

(1) The metered value shall represent the quantity electricity that is metered, calculated and accepted as registered by an electricity metering device for periodically metering or through load profile integrated for the settlement period.

(2) Each owner of the metering system shall be responsible for the reading of all metered values according to the Georgian Electricity Market Rules and Transmission Grid Code.

(3) In case of missing hourly data from separate metering systems and with the purpose to meet the deadlines for submission of information to Market Operator, the TSO can use replacing values calculated on the basis of preceding settlement periods or otherwise as specified in the contract for access to the distribution/transmission network of the market participant.

(4) The metered values received can be appealed by the market participants within three (3) working days after receiving the statement of metered volumes. The owner of the metering devices shall implement an examination and shall confirm or correct the metered values. Values which are not appealed within this deadline shall be considered confirmed.

(5) All metered values including these that were subject to examination, according to (4), shall be considered by the Market Operator as confirmed by the parties not later than the ninth (9) day of each calendar month following the month of settlement and shall be considered as confirmed metered values. In case the agreement between the parties is not reached after this date, the dispute shall be settled according to Transmission Grid Code.

(6) The provisions of this section shall be applicable also for the metering points which correspond to installations of producers and consumers who provide ancillary services to the Transmission System Operator.

ARTICLE 18. Aggregation and submission of the metered values

(1) After determination of the confirmed metered values, the TSO shall determine the total physical deliveries of electricity for each producer and each consumer/supplier of end consumer (as appropriate), for the relevant network for each settlement period.

(2) The total generation of a producer shall be equal to the amount of all confirmed metered values at the connection points of the generation blocks to the relevant network.

(3) The total consumption of a consumer shall be equal to the amount of all confirmed metered values at the connection points /metering points of this consumer, connected to the relevant network.

(4) The net generation of the relevant network shall be equal to the amount of the total generation of all producers connected to this network.

(5) The net consumption of the relevant network shall be equal to the amount of the total consumption of all consumers of this network.

(6) The electricity provided to other networks shall be equal to the amount of all metered values certifying the electricity exchange from the relevant network to other networks. As in regards to the electricity transmission network, the electricity export shall be included to the exchange with other networks, as well.

(7) The electricity provided from other networks shall be equal to the amount of all metered values certifying the electricity exchange from the other networks to the relevant network. As in regards to the electricity transmission network, the electricity import shall be included to the exchange with other networks, as well.

(8) The TSO shall submit to the Market Operator aggregated and validated data from the commercial electricity metering devices as per paragraph (2) and paragraph (3), daily and monthly basis, connected to the relevant electricity network.

ARTICLE 19. Determination of the technological losses in the network

(1) All metered values from the commercial electricity metering devices between the electricity transmission network and the electricity distribution networks, as well as between the separate electricity distribution networks, shall be metered and used in the determination of the losses of the transmission company and the distribution companies.

(2) The technological losses in the network shall be determined separately for the electricity transmission network and each electricity distribution network.

(3) The transmission company, in accordance with the ownership of the network for which it is responsible, shall determine the technological losses in the relevant network for each settlement period as the difference between the overall electricity quantity fed in the relevant network at the metering points and the electricity quantity consumed in the relevant network or supplied in other networks, according to the confirmed metered values.

(4) The MO shall calculate the imbalances on the basis of the determined technological losses under paragraph 3 and the delivery schedules for coverage of the technological losses.

(5) The distribution and transmission companies shall develop and present to GNERC "Methods for calculation of technological losses in the network".

(6) The methods shall be approved by GNERC and shall be applied by the MO in the calculation of the imbalances from technological losses of the market participants.

(7) All technological losses in the networks, determined under paragraph 5, shall be considered as confirmed metered values.

ARTICLE 20. Aggregation of metered values as in regard to the implementation of the activity „Imbalances settlement“ by the MO.

(2) TSO shall identify physical imbalances in the system and provide the following information to MO related to:

- the confirmed metered values separately for all entities that shall provide information on ancillary services;
- technological losses in the network;
- net generation and net consumption in the relevant network;

- electricity supplied to other networks;
- electricity provided by other networks.

(2) The Market Operator shall implement final physical settlement for each Market Participant until the tenth day of each calendar month following the month of the metering devices reading.

(3) The Market Operator shall implement financial settlement on a monthly basis of each Market Participant, in accordance with the Balancing and Settlement Rules.

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