

INTRODUCTION

Albanian Distribution Functioning Code (Distribution Code) is part of secondary legislation established under the Law No. 9072, dated 22.05.2003 "On Power Sector" (PSL), amended

Distribution Code is a set of rules, norms, procedures and technical requirements to administrators and users of distribution network that establish their relations based on this Distribution Code.

Pursuant to legal obligations established by the Law No. 9072, dated 22.05.2003 "On Power Sector" (PSL), the Distribution Code is composed of four parts:

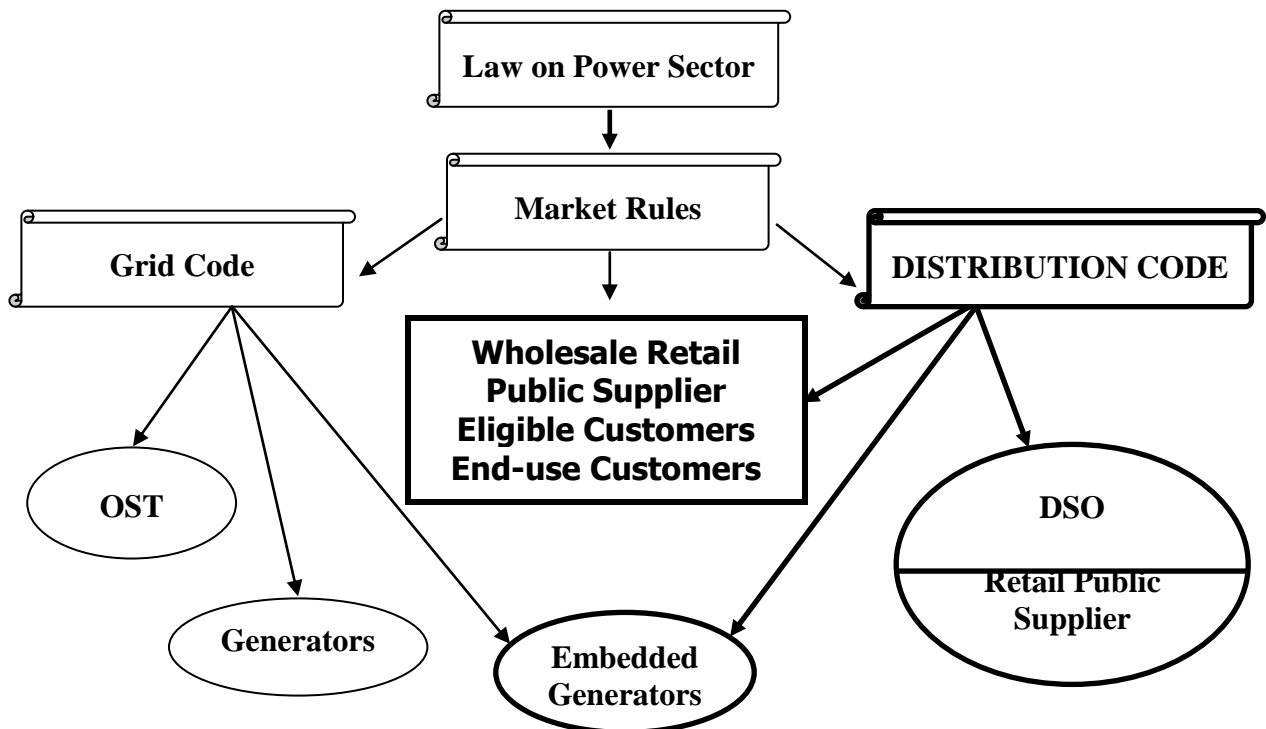
Chapter I: General Provisions chapter specifies general technical and procedural issues.

Chapter II: Planning specifies the criteria and procedures to be implemented by DSO as they plan and develop the Distribution System.

Chapter III: Operation specifies the terms for the DSO to operate the Distribution System.

Chapter IV: Connection specifies the terms, criteria and deadlines to be fulfilled by Customers in order to connect to the Distribution System or modify their existing connections.

Figure No. 1 Distribution Code in the framework of Power Sector Legislation



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CHAPTER I - GENERAL PROVISIONS

I. GENERAL ISSUES

I.1 PURPOSE

I.1.1 The purpose of the Distribution Code is to promote and impose the minimal electricity market technical rules and requirements intended to provide the reliable, stable and economic operation of the electricity distribution network, mandatory for the DSO, Retail Public Supplier, Eligible Customers and users connected to the distribution network.

I.2 The OBJECTIVES of the DISTRIBUTION CODE

I.2.1 Establishment of a set of rules and norms with a view to provide the access of the third parties to electricity distribution networks

I.2.2 Establishment of responsibilities and obligations for the DSO, Retail Public Supplier, Eligible Customers and for all the users of the distribution networks

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I.2.5 Establishment of requirements for the development of the distribution networks

I.2.6 Establishment of requirements for information exchange between the DSO, Retail Public Supplier, Eligible Customers and users of the distribution network

I.3 ATTRIBUTES and COMPETENCES of DSO and RETAIL PUBLIC SUPPLIER

I.3.1 Distribution networks are managed by companies licensed to perform activities in the electricity distribution sector in specified areas

I.3.2 In their areas the DSO and Retail Public Supplier:

- a) Supply and sale electricity to tariff customers connected to the Distribution System, except for the Eligible Customers
- b) Manage the distribution network

- c) Maintain the environment and equipment according to technical requirements
- d) Develop the Distribution System according to perspectives of economic development and changes of electricity demands in the area
- e) Provide other services to customers that are necessary to fulfill their obligations according to the legislation in force

I.4 DSO and RETAIL PUBLIC SUPPLIER TASKS

I.4.1 Albanian electricity system DSO and Retail Public Supplier have the following tasks consistent with the Directive 2003/54/EC of the European Parliament and of the European Council:

- i. DSO shall maintain a secure, reliable and efficient electricity distribution system in its area with due regard for the environment
- ii. DSO and Retail Public Supplier must not discriminate between system users or classes of system users, particularly in favor of its related activities
- iii. DSO and Retail Public Supplier shall provide system users with the information they need for efficient access to the system
- iv. DSO when dispatching (under directives of the OST) embedded generating units may give priority to the generating units using renewable energy sources or waste or producing combined heat and power
- v. Wholesale Public Supplier shall procure the energy for Retail Public Supplier customers according to transparent, non-discriminatory and market based procedures
- vi. When planning the development of the distribution network, energy efficiency/demand side management measures and/or distributed generation that might supplant the need to upgrade or replace electricity capacity shall be considered by the DSO

I.5 DISTRIBUTION CODE ADMINISTRATION

I.5.1 DSO and Retail Public Supplier are the administrators of the Distribution Code:

- i. DSO and Retail Public Supplier are responsible for the implementation of the Distribution Code
- ii. Distribution System users are required to apply the Distribution Code requirements.
- iii. Users shall provide to DSO and Retail Public Supplier the right of access in their premises for services and necessary facilities according to DSO and Retail Public Supplier responsibilities

- iv. Users shall apply the orders and guidelines issued by the DSO and Retail Public Supplier which are required to implement the Distribution Code.
- v. DSO and Retail Public Supplier shall review periodically the implementation of the Distribution Code. For this scope, the Distribution Code Review Commission shall be established. No review or modification of the Distribution Code may be performed without prior discussions with the ERE and without the ERE's approval.

I.5.1 *Distribution Code Review Commission*

- I.5.1.1 The Review Commission shall be managed by the DSO and Retail Public Supplier, and will be composed by following members:
 - i. Chairman appointed by the DSO and Retail Public Supplier
 - ii. The Secretary appointed by the DSO and Retail Public Supplier
 - iii. A member representing all embedded generating units directly connected to the distribution network
 - iv. A member representing tariff customers interests
 - v. A member representing the OST
 - vi. A member representing all suppliers including Qualified Suppliers
 - vii. A member representing Traders
 - viii. A member representing the Eligible Customers.
- I.5.1.2 Within 30 days from the approval of the Distribution Code, DSO together with Public Supplier authorize the chairman and the secretary of the Review Commission to officially inform all the members of the Review Commission for the first meeting, at least seven days before the date established for the Review Commission meeting.
- I.5.1.3 Participants in the Review Commission shall inform the secretary on names and functions of their representatives no latter than three working days before their first meeting.
- I.5.1.4 Within 30 days from the first meeting, the Review Commission shall prepare the regulation of the Review Commission's activity. The Review Commission shall meet every three months or when a Review Commission participant requires it.
- I.5.1.5 The decisions of the Review Commission are taken with consensus. In case a consensus is not reached, all proposals from parties to the Review Commission shall be submitted to the ERE, whose decision shall be binding for all parties.

I.5.2 *Functions of the Distribution Code Review Commission*

I.5.2.1 The Distribution Code Review Commission shall:

- i. Continuously observe implementation of the Distribution Code and take initiatives to review it
- ii. Analyze every serious breakdown in the distribution network and based on this analysis continuously review the Distribution Code
- iii. Consider all requirements for the Distribution Code modifications, submitted by parties, and send to the ERE for reviewing
- iv. Inform the parties on recommendations for changes to the Distribution Code and the respective reasons or objections, if there are any
- v. Examine issues raised by users.

I.6 **DISPUTES****I.6.1 *Dispute Settlement Procedures***

I.6.1.1 In case of a dispute between users and the DSO or Retail Public Supplier, the dispute shall be solved based on provisions of the Distribution Code and the legislation in force.

I.6.1.2 In case of a conflict between provisions of the Distribution Code and other by-legal acts approved by the ERE, the latter shall decide on provisions to be used

I.7 **EMERGENCY PERIODS**

During emergency periods as defined by the Law No. 9072, dated 22.05.2003 "On Power Sector", the Distribution Code or special parts of it shall be treated as temporary suspended for as long as the emergency situation lasts.

CHAPTER II - PLANNING

The Planning Chapter specifies the criteria and the procedures to be complied with by the DSO and Retail Public Supplier in the planning and development of the distribution system, and by users of the distribution system when planning the development of their installments.

II.1 SCOPE

II.1.1 The planning of the distribution system development has the following objectives:

- i. To prepare the perspective plan of the Distribution System for electricity distribution in the quantity and quality required by users
- ii. To define the operation of the Distribution System according to safety requirements and guarantee the electricity distribution at the required quality levels
- iii. To encourage efficient investments in the Distribution System, through initiation of required procedures and collection of information required to prepare the development plan

II.1.2 The development and modernization of the Distribution System takes in consideration:

- i. The increase of electricity demand
- ii. The development and systematization of rural and urban areas
- iii. The establishment of new points or modification of the existing ones
- iv. The need to improve the performance indicators for the electricity distribution service

II.2 PLANNING OBJECTIVES

II.2.1 The Planning Objectives are to:

- i. Enable the planning, designing and construction of the Distribution System for an economic and safe operation
- ii. Facilitate the use (provide access) of the Distribution System by new users requiring to be connected to the system and specify standards of supply
- iii. Provide sufficient information for users of the Distribution System to assess opportunities for connection, and plan and develop their installation so as to be compatible with the Distribution System
- iv. Formalize system planning data requirements

II.3 PREPARATION of DEVELOPMENT PLAN for the DISTRIBUTION SYSTEM

II.3.1 The preparation of the development plan for the Distribution System is based on the following data:

- i. Demand forecasts provided on yearly basis from suppliers (including load type curves for specific days)
- ii. Forecasts of electricity production from existing generators (10 years max)
- iii. Safety level defined for the Distribution System in total and for each node according to legislation in force
- iv. The strategy of development of telecommunication infrastructure of the DSO

II.4 PLANNING CRITERIA

II.4.1 The Distribution System Development Plan shall be prepared based on a perspective development study of the electric network for an average time-period of 5 to a maximum of 10 years. The Distribution System development plan takes in consideration:

- i. Safe and steady operation, and application of standards for a qualitative service of electricity distribution
- ii. Use of Distribution System capacities within economic limits
- iii. Selection of development alternatives of maximal economic efficiency
- iv. Definition of economic operation of the Distribution System under unreliable load conditions
- v. Observance of safety norms, as well as fire protection legislation

II.4.2 The Distribution System development plan aims also to limit the negative environmental impact, mainly from:

- i. Chemical pollution
- ii. Aggressive environmental conditions (humidity, extended frost, ice, salts, powerful winds, turbulent air in vertical corridors, etc)
- iii. Natural disasters (earthquakes, floods)
- iv. Atmospheric discharges

II.4.1 *Criteria for the Dimensional Verification of the Distribution System*

II.4.1.1 The dimensional verification of the Distribution System shall be performed in conformity with effective technical norms taking in consideration:

- i. The economic criteria
- ii. The thermal stability criteria in long-term operation

- iii. The thermal stability and dynamic criteria in short circuit regime

II.5 PLANNING and DEVELOPMENT of NETWORK

II.5.1 *Forecasts for Connection Point to Distribution Network*

- II.5.1.1 DSO together with Retail Public Supplier must give a 30 days written notice to each users of the Distribution System of the annual date by which the user of the Distribution System must provide the DSO and Retail Public Supplier with the required information.
- II.5.1.2 Details of planned future capacity must be provided by the users of the Distribution System to the DSO and Retail Public Supplier, if the latter has requested such information according to the procedure set out in the Distribution Code, as well as information regarding the active power capability and reactive power capability, proposed commencing date, operating times and special operating requirements. Any user of the Distribution System must provide accurate information, including details of any factors which may have impact on capacity forecasts or foreseen generation facilities.
- II.5.1.3 If the DSO together with Retail Public Supplier reasonably assesses any forecast information to be unrealistic, the DSO and/or Retail Public Supplier may modify that forecast information and must give an opinion to the users of the Distribution System in writing of this action and the reason for the modification. The DSO and Public Supplier shall not be responsible for any adverse consequences of this action or consequences which might occur if the information indicated is not modified.

II.5.2 *Development of Distribution Network*

- II.5.2.1 DSO together with Retail Public Supplier must analyze the operation of the Distribution Network over a specific planning period, taking into account the forecast capacities and loads, any future generation and transmission development and any ther essential information.
- II.5.2.2 DSO and Retail Public Supplier shall co-operate with the OST Transmission System Operator to review the annual plan for the development of distribution system. The annual planning review must incorporate the existing connection points and review of planning proposals for future connection points. Every year the DSO and Public Supplier must provide the ERE with specified long-term (average 5 years to maximal 10 years) plan, consequently adjusted based on international experiences, development of technologies, changes in the national economy and its development. Every year DSO and Retail Public Supplier must adjust its long-term development plan according to the transmission system development plan prepared by the OST.

- II.5.2.3 If services of the DSO at connection points are directly affected by an augmentation of load of a user, appropriate amendments to the relevant connection agreement must be negotiated in good faith between the parties in order to establish new terms in this connection point. When the DSO agrees with an embedded generator directly connected to the Distribution System to use it periodically to ensure the network support functions then the costs of this network support service must be included in the calculation of distribution service prices determined in the distribution tariff methodology. Being the case, the DSO undertakes the following actions:
- i. Registers the embedded generator directly connected to the distribution system and specifies that the embedded generator may be periodically used to provide a network support function
 - ii. Includes the cost of the distribution system support service to the DSO in the calculation of distribution service tariffs determined in accordance with tariff methodology.

II.5.3 *Distribution Network Planning*

The distribution Network Planning is carried out by the DSO and Retail Public Supplier based on requirements of users connected to the Distribution System as well as the Transmission System Planning performed by the OST. DSO, Retail Public Supplier and the OST Transmission System Operator shall cooperate to fulfill their obligations regarding the complete network planning. DSO, Retail Public Supplier and the OST Transmission System Operator, based on mutually taken decision, jointly cover the costs incurred for studies required for planning actions.

II.6 DISTRIBUTION SYSTEM DESIGNING STANDARDS

- II.6.1 The Distribution System Designing Standards provide to potential users of the Distribution Systems the information needed to install the equipment in their connection points with the Distribution System. The Distribution System designing standards are the following:
- i. The supply frequency has its nominal value (Nominal Frequency) of 50 Hz. Taking in consideration that the frequency is a main parameter for the safe operation of the power system, the DSO shall install in their system the automatic discharge load due to frequency reduction (SHAF). The operation structure of SHAF is prepared by the OST in cooperation with DSO.
 - ii. The normal operating frequency range: 49.8 to 50.2 Hz.
 - iii. During system disturbances the frequency range is: 48.0 to 52.0 Hz.

II.6.2 Voltage Levels in the Distribution System are:
 220 V, 380 V, 6 kV, 10 kV, 20 kV, 35 kV, 110 kV (excluding 110 kV lines)

Table of Operating Voltage Range

Nominal Voltage	Lowest Voltage	Highest Voltage
220 V	- 10%	+5 %
400 V	- 10%	+5 %
10 000 V	- 5 %	+ 5 %
20 000 V	- 5 %	+ 5 %
35 000 V	- 5 %	+ 5 %
110 000 V	- 5 %	+ 5 %

II.7 REQUIREMENTS to GENERATORS DIRECTLY CONNECTED to the DISTRIBUTION SYSTEM

II.7.1 The Distribution Code is applicable to all existing or prospective Generators directly connected to the Distribution System, including Co-generators, Auto-producers and Generators using renewable sources of energy.

II.7.2 Generators with stand-by generators that are connected to the Distribution System must comply with requirements of DSO avoiding parallel operation with network. These requirements are prescribed in the Connection Agreement. Generators directly connected to the Distribution System shall initiate discussions at early stage in design to allow the DSO to inspect the impact of the Generating Unit on the Distribution System.

II.7.3 The DSO may refuse permission for connection of the Generating Unit at a point on the Distribution System, or may require revision of the construction or technical parameters of the generation unit, or impose certain operation restrictions in order to ensure that security and quality of supply standards are maintained. In such instances, the DSO shall provide sufficient explanatory information to justify the refusal or the required revisions. All Generators directly connected to the Distribution System shall provide the DSO all the data and information requested by DSO according to deadlines defines by this Distribution Code.

II.7.2 *Requirements to all Customers including Eligible Customers connected to the Distribution System*

- II.7.2.1 Customers connected to the Distribution System shall provide to the DSO and Public Supplier the following data, as well as all the data and information requested by DSO and Retail Public Supplier according to deadlines defined by this Distribution Code.
- i. Annual demand for active electricity
 - ii. Annual demand for reactive electricity
 - iii. Demand for maximal annual electricity
 - iv. Maximal load for each phase
 - v. Load type, peak days
 - vi. Nominal voltage of load point of supply
 - vii. Sensitivity of load from voltage and frequency

II.7.3. *Transferring of Planning Data*

- II.7.3.1 DSO together with Retail Public Supplier in coordination with the OST Transmission System Operator shall decide on the timing for planning periods and necessary data to be provided for planning purposes. Distribution System users shall provide, upon DSO's and Retail Public Supplier's requests, the following information as well as any other information required by the DSO and/or Retail Public Supplier:
- i. Increase/decrease in load and demand during next planning period
 - ii. Capability to participate in production or compensation of reactive energy
 - iii. Absence or occurrence of disturbing loads
 - iv. Energy to be traded and addresses of suppliers in case the users of the Distribution System are Qualified Suppliers and/or Traders without distribution assets
- II.7.3.2 Generators connected to the Distribution System shall provide, upon DSO's request, information as follows as well as any other information required by DSO:
- i. General information on their generators' physical condition
 - ii. Demand projections in case of cogeneration type of generation
 - iii. Maximum/minimum generating capacity projections
 - iv. Electricity production projections
 - v. Reactive power capabilities
 - vi. Other data required by the DSO
- II.7.3.3 Users of the Distribution System shall provide planning data for specific future time periods updated annually as necessary including projected demand requirements and anticipated changes in maximum demand or generating capacity.

- II.7.3.4 In addition to periodic updates of planning information, Users of Distribution System shall give adequate notice of any significant change to their system or operating regime to enable the DSO to prepare its development plans and implement any necessary system modifications. In the event of unplanned changes in a user's system or operating regime a user of the Distribution System shall notify the DSO as soon as it is practically possible to take any necessary measures that can be implemented.
- II.7.3.5 Users shall also provide details of reactive compensation plant directly or indirectly connected to the Distribution System, including its rating and operational control.
- II.7.3.6 Users may be required to provide the DSO with detailed data relating to the interface between their installations and the Distribution System covering circuit parameters, switchgear and protection arrangements of equipment directly connected to or affecting the Distribution System to enable the DSO to assess any implications associated with these points of connection.

II.7.4 *Information to be exchanged*

- II.7.4.1 Upon the request of a user of the Distribution System, the DSO and/or Public Supplier shall provide information and data, as may be reasonably required by the user. In case the DSO and/or Retail Public Supplier decide the information or data requested by the user of the Distribution System may harm the business of the DSO and/or Retail Public Supplier or of other Distribution System users, the DSO and/or Retail Public Supplier shall refuse to provide such information or data.
- II.7.4.2 The DSO shall provide information on request to users of the Distribution System regarding the local network conditions to enable them to determine their protection requirements and to assess the need for backup facilities.
- II.7.4.3 When the user installation is connected to the busbars of the Distribution System's substation, sufficient details may need to be exchanged with respect to the user of the Distribution System/the DSO's ownership boundary to enable an assessment of transient over-voltage effects will be made. The request for information may be initiated by either the DSO or the user of the Distribution System.
- II.7.4.4 Information may be exchanged between the DSO and the user on short-circuit current levels at the feeding busbar or point of connection to the Distribution System as appropriate, in the form of:
 - i. Three phase and single phase earth short circuit current.
 - ii. The X/R ratio under three phase fault conditions (X is the inductive reactance and R the active resistance).
- II.7.4.5 Information shall be exchanged between the DSO and the user of the Distribution System on demand transfer capability where the same demand

can be supplied from alternate user points of supply. This shall include the proportion of demand normally fed from each point of supply and the arrangements (manual or automatic) for transfer under planned/fault outage conditions.

II.7.5. Planning Studies

- II.7.5.1 In order to facilitate new connections/modifications of existing connections to the Distribution System the DSO and Retail Public Supplier shall prepare upon request a study showing the implications of a connection/modification at a particular point on the Distribution System.
- II.7.5.2 A reasonable charge may be levied by the DSO and Retail Public Supplier for the planning study purpose, based on the study's cost.
- II.7.5.3 Users of the Distribution System or potential users of the Distribution System shall provide to the DSO information regarding the proposed facility including load details, interface arrangements, proposed connection point and withdrawal/injection of power for Distribution System necessities.
- II.7.5.4 The studies shall normally be prepared within 45 days after the date of payments received or the agreement signed of the person making the request to pay the cost of the study. In the case of Embedded Generators and Eligible Customers seeking connection to the Distribution System, depending on the nature and complexity of the request, this period may extend up to 100 days.
- II.7.5.5 Details of the procedures for application for connection to the Distribution System are described in the chapter "Connection to the Network" of this Distribution Code. The DSO shall provide on request a statement of present and future Distribution System capacities, forecast power flows and loadings on parts of the Distribution System specified in the request and shall include fault levels at each Distribution node covered by the request. The DSO may levy a charge for the provision of this statement on account of the reasonable costs incurred by the DSO in preparing this statement. The statement shall be prepared within 45 calendar days. In the case of Embedded Generators connected to the Distribution System and Eligible Customers seeking connection this period may extend up to 60 days depending on the nature and complexity of the request.

CHAPTER III - OPERATION

The Operation Chapter specifies the terms to be applied by the DSO as operating the Distribution System.

III.1 DEMAND FORECASTING

- III.1.1 In order for the DSO to operate the Distribution System efficiently and to ensure maximum system security and system stability, there is a need for users of the Distribution System to provide loading and generation output information to the DSO.
- III.1.2 The Operation chapter in this Distribution Code specifies the information to be provided to the DSO by users of the Distribution System so that these requirements can be met.
- i. The information to be provided is required to enable the DSO to maintain the integrity of the Distribution System.
 - ii. Where demand data is required from the users of the Distribution System, this means the amount of electricity in MWh demanded at the Connection Point. The DSO may in certain cases specify that the demand data shall include the demand in MVAR.
 - iii. The means of providing the information to the DSO and its confirmation includes any written form, or any other suitable means of electronic transfer which enables the recipient to retain information.
- III.1.3 Requirements of the above provisions shall apply to all main users of the Distribution System.

III.2 INFORMATION FLOW AND COORDINATION

- III.2.1 The DSO shall co-ordinate demand forecast information for each connection point with the OST Transmission System Operator to meet the requirements of the Grid Code.
- III.2.2 Information for embedded generators connected to the Distribution System which are not subject to the OST System Dispatch Operator, shall be provided directly to the DSO. Centrally dispatched generating units shall comply with the requirements of the Grid Code. Information shall be provided directly to the OST System Dispatch Operator.

III.3 DEMAND FORECAST DATA

III.3.1 Generating Units greater than 1 MW and not subject to the OST System Dispatch Operator shall provide to the DSO information regarding output and planned shutdowns for specified future periods. This shall be provided on an annual basis when requested by the DSO.

III.3.2 The information required is given in the following table:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Maximum active power output MW (annual hour)						
Production MWh						
Planned shutdown periods:						
- start of shut-down						
- termination of shut-down						

III.3.3 The main users of the Distribution System shall provide to the DSO information regarding demand and planned shutdowns for specified future periods. This shall be provided on an annual basis when requested by the DSO.

III.3.4 The information required is given in the following table:

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Maximum active power demand MW						
Power factor (cosφ)						
Annual energy demand MWh						
Planned shutdown periods:						
- start of shut-down						
- termination of shut-down						

III.4 OPERATIONAL PLANNING

III.4.1 Distribution Code is concerned with the co-ordination of planned outages of user's plant/installation which affects the operation of the Distribution Systems.

III.4.2 Distribution Code supplements the obligation of the DSO to provide certain information to the OST Transmission System Operator under the Grid Code

and establishes procedures to enable the collection of such data from users of the Distribution System.

- III.4.3 The requirements of the information set out in the Grid Code to be provided by the OST Transmission System Operator will form the basis of the DSO Operational Planning.
- III.4.4 The objectives of Operational Planning are to:
- i. Set out the rules of embedded generator outage, as required by the generator or the Distribution System.
 - ii. Specify the information to be provided by users of the Distribution System to the DSO allowing it to comply with the Grid Code.
 - iii. Operational Planning applies to all main users of the Distribution System.
- III.4.5 Information on embedded generator connected to the Distribution System not subject to central dispatch (including Generators with CHP and Auto-producers) shall be provided directly to the DSO.
- III.4.6 The OST dispatched generating units shall comply with the requirements of the Grid Code. Information shall be provided directly to the OST System Dispatch Operator.
- III.4.7 Timescales and data:
- i. Detailed implementation of data gathering and timescales shall be determined by the DSO for each users of the Distribution System
 - ii. The information may be required for different timescales as may be determined by the OST System Dispatch Operator or the DSO planning needs.

III.5 INFORMATION FROM GENERATORS CONNECTED TO THE DISTRIBUTION SYSTEM

- III.5.1 Information from embedded generating unit greater than 1 MW and not subject to the OST System Dispatch shall include details of planned outages for maintenance or other purposes as well as the expected time of return to service. The generating unit shall not synchronize without first obtaining operational permission from the DSO unless a prior agreement has been reached with the DSO.

III.5.2 *Information to Users of the Distribution System*

- III.5.2.1 The DSO shall inform all customers or generators who may be significantly affected by particular outages, of the likely dates and duration of the outages.
- III.5.2.2 If there are any objections from users they shall be considered by the DSO, and alternative arrangements will be proposed if possible.

III.6 LOAD CONTROL

- III.6.1.1 Distribution Code permits the DSO, under certain circumstances, to apply reductions in load in the event of insufficient generation in the Power System and/or transmission capacities from external interconnections lines being unavailable to meet demand or in the event of breakdown and/or operating problems (such as in respect of system frequency, system voltage levels or system thermal overloads) on any part of the transmission or the Distribution System.
- III.6.1.2 The load control procedures ensure that hardship to users of the Distribution System is minimized and that all parties affected are treated equitably. The load control term is used to describe any or all of these methods of achieving a demand reduction.
- III.6.1.3 Distribution Code deals with the following means of reducing load:
- i. Automatic load disconnection due to low frequency
 - ii. Manual load reduction of Distribution System user
 - iii. Users of the Distribution System load manual reduction instructed by the OST or the DSO
 - iv. Emergency manual load disconnection
- III.6.1.4 Where load control is exercised by the DSO it shall be done in a manner that practically no user of the Distribution System (customer or supplier) shall be discriminated, and reasonable actions shall be used to ensure that the burden is shared fairly among customers.
- III.6.1.5 DSO following an instruction of the OST or otherwise to achieve a reduction in load that will either avoid or relieve operating problems on the Transmission System and/or the Distribution System, must operate in a manner that does not unduly discriminate any supplier or customer.
- III.6.1.6 Implementation of load control by the DSO may affect all users of Distribution System (Customers of Suppliers) connected to the Distribution System and where applicable, contractual arrangements between suppliers and their customers may need to reflect this.

III.6.2 *Methods of Load Control*

- III.6.2.1 Customer load may be disconnected automatically at selected locations in accordance with the requirements of the Grid Code, in the event of a sudden fall in frequency. Such an arrangement shall be carefully co-ordinated as part of an overall scheme and may take into account any operational requirements or essential load.

- III.6.2.2 Automatic disconnection by under voltage relay may be used to indiscriminately disconnect load in order to maintain frequency within acceptable limits, so as to avoid widespread load shedding or black-outs.
- III.6.2.3 Emergency manual load shedding may be carried out on the Distribution Systems for reasons of shortfall in supply or other reasons defined in this Distribution Code.
- III.6.2.4 OST and DSO must agree in advance on load shedding schedules and establish sequence and amount of disconnected load.
- III.6.2.5 Load shedding schedules approved by the OST must be in disposal of each operational unit of the DSO executing load shedding operations.
- III.6.2.6 In case of a sustained period of shortfall then planned rotating load shedding may be used to share the available power among affected users of the Distribution System (Customers). In such circumstances the DSO shall inform all users through public informing means on the shedding territory and its duration.

III.6.3 *Application of the Load Control*

- III.6.3.1 When load control is exercised by the DSO in order to protect the Distribution System, or by the OST's request to maintain the Power System, DSO should immediately respond to such requirements and inform other users of the Distribution System at the possible extent.

III.6.4 *Operational Communications and Consultations*

- III.6.4.1 The Distribution Code sets the requirements for the exchange of information in relation to operations and/or events on the Distribution System or the installation of any users connected to the Distribution System causing operational effect on the Distribution System or the installations of other users of the Distribution System.
- III.6.4.2 Requirements of the Distribution Code for the exchange of information in relation to operations and/or events on the Distribution System shall apply to all main users of the Distribution System.
- III.6.4.3 The DSO and the main users of the Distribution System connected to the Distribution System shall nominate persons and/or contact addresses, and agree on communication channels for the necessary exchange of required information.
- III.6.4.4 SCADA equipment may be required and installed at a main user's site (with DSO decision) for the transmission of information and data to and from the DSO or the OST. The requirement to provide this information shall be included in the Connection Agreement.

- III.6.4.5 Information between the DSO and the users of the Distribution System shall be exchanged upon a reasonable request of either party. The request may be in accordance with a prior agreement to exchange information for different reasons. This does not preclude the voluntary exchange of information which may be deemed relevant to the operation of the Distribution System or user installation.
- III.6.4.6 In the case of an operational action in the Distribution System or upon receipt of notification on an operation action in the Transmission System, which in the opinion of the DSO, will have an operational effect on the installation of a user connected to the Distribution System, the DSO shall notify the user through public communication means.

III.7 DISTRIBUTION NETWORK MANAGEMENT THROUGH THE DISPATCHING

III.7.1 *General Provisions*

- III.7.1.1 The Distribution System Management through dispatching is a specific activity in the electricity sector performed by specialized units (dispatching functions/levels) in hierarchic relations with the authorities participating in the electricity market.
- III.7.1.2 The Distribution System Management through dispatching provides safety, qualitative and economic conditions of operation through common operation of installations and equipment of the Distribution System requiring a unique management.
- III.7.1.3 The Distribution System Management through dispatching is unique and hierarchically organized at central and local levels.
- III.7.1.4 The main functions of the Distribution System Management through dispatching are:
- i. use of the Distribution System operational plan
 - ii. Distribution System operative management at local level, according to rules for the operative separation of managing authorities for installments
- III.7.1.5 Management through dispatching is based on specific rules of organization and operation applied by the OST, local dispatch and operative staff in user's installments and facilities.
- III.7.1.6 Management levels of the Distribution System, through dispatching are:
- i. Power System Central Dispatch Centre
 - ii. DSO local dispatch centers
 - iii. Operative staff in Distribution System users' installments and facilities

[**Note:** Orders issued by the OST are mandatory to all local dispatch centers and operative staff in users' installment and facilities.]

- III.7.1.7 DSO shall have its own local dispatch centers. Local dispatch centers shall be established to check and command the medium voltage networks.
- III.7.1.8 Operative commands for the medium voltage network shall be established by respective centers taking in consideration the installments volume and specifics, the technical level and safety rules.
- III.7.1.9 The management level through dispatching includes:
 - i. Operative command department with staff working in shifts to manage in due time the installment operation by coordinating the regimes and maneuvers.
 - ii. A supply, planning and operative scheduling department that observes and analyzes the operations and elaborates specific rules.
- III.7.1.10 The Transmission System users have the obligation to supply their installment with experienced staff to manage the Distribution System through dispatching.

III.7.2 *Activities of Dispatch levels within DSO*

- III.7.2.1 The DSO performs its planning and operative management activities, as well as specific activities through its management level with respective local dispatch centers.
- III.7.2.3 DSO has the obligation to perform its dispatching activities in the Distribution System in a non-discriminatory way for all electricity market participants.
- III.7.2.3 ***The DSO performs the following activities:***
 - i. Authorizes the staff on operative management in conformity with effective rules
 - ii. Collects, registers and archives statistical data on the Distribution System operation according to effective rules
 - iii. Provides information exchange with Distribution System users and other Electricity Market participants
 - iv. Cooperates with Distribution System users for the development of studying and operative analyses
 - v. Schedules, develops, rehabilitates and modernizes its own dispatching systems under acceptable economic and power efficiency terms, in conformity with local power programs, consumption/development forecasts, technological progress and effective norms
 - vi. Coordinates, repairs and develops a DSM/SCADA system in the Distribution System levels in order to allow the monitoring and management of the Distribution System through dispatching; and:

- a) Develops, modernizes and protects its own DSM/SCADA and telecommunication systems
- b) Requires the Distribution System users to establish SCADA local systems in accordance with management requirements of Distribution System through dispatching
- vii. Prevents prolonged disorders in the Distribution System and observes the quality service norms of electricity distribution
- viii. Offers consulting on management issues through dispatching in other levels of management and third parties

III.8 OPERATIONAL SCHEDULE

III.8.1 The operational schedule consists in the following elements:

- i. List of normal scheme of operation
- ii. List of use and maintenance activities of the Distribution System installations
- iii. List of protection and automatic systems of the Distribution System
- iv. List of voltage levels in the Distribution System
- v. Registers, processes and archives of the DSO and required data for analyses and scheduling of the Distribution System
- vi. Analyzes and certification of testing programs with equipment connected to the Distribution System or influencing its operation or the power system operation
- vii. Testing programs influencing the 110 kV network that should be approved by the OST

III.8.2 *Scheduling of Normal Operation Schemes*

III.8.2.1 Every three months, the DSO shall submit for approval to the OST the normal operation scheme for the Distribution System and the connection scheme of dispatching units. DSO proposals shall be implemented only after the OST approval.

III.8.2.2 The Distribution System normal operation scheme is analyzed based on verifying calculation, referring to following parameters:

- i. Power flow under safety criteria terms
- ii. Voltage levels
- iii. Short circuit flow levels
- iv. Neuter regime mode
- v. Safety of operation for automatization and system protection

III.8.3 *Operation and Maintenance Scheduling of Distribution System Installments*

III.8.3.1 The DSO shall prepare and submit for approval to the OST annual, seasonal and monthly schedules for power flows influencing the power system operation.

III.8.4 *Operative Management of the Distribution System*

III.8.4.1 Operative Management of the Distribution System includes the following specific activities:

- i. To observe the Distribution System operation
- ii. To manage the Distribution System operation
- iii. To manage the units that are not under operative command of the OST
- iv. To manage the protection and automatization systems

III.8.4.2 The DSO analyzes the Distribution System operation program and observes the performance and standards of distribution service through appropriate actions.

III.8.5 *Operative Scheduling of Distribution System Activity*

III.8.5.1 The operative scheduling of Distribution System activity has the following components:

- i. Scheduling of operation schemes
- ii. Scheduling of units connected to the Distribution System
- iii. Scheduling of voltage level
- iv. Scheduling of protection and automatic system

III.8.5.2 The operative scheduling of the Distribution System is performed according to rules of this Distribution Code and respective norms in force. The specific activities of the DSO shall be coordinated with the Distribution System users' activities taking in consideration the technical rules and signed contracts. Upon the OST request, the DSO has the right to immediately act against the malfunctioning of electric installments (plants) that risk the Power System safe operation and customers' supply.

III.8.5.3 DSO may not modify the regime or adjust the conditions of automatic and protection systems established by the OST without its preliminary approval.

III.8.6 *Distribution System Operation Commands*

III.8.6.1 DSO shall implement the operation programs according to the Distribution System operation schedule under normal working regimen.

- III.8.6.2 DSO shall observe the Distribution system operation through collection of necessary data referring to:
- i. Typical parameters of operation regime:
 - a) Frequency
 - b) Voltage in Distribution System nodes
 - c) Flow of active and reactive power through the Distribution System elements
 - d) Active and reactive power injected in each Distribution System connection point
 - ii. Distribution System configuration
 - iii. Exceeding of some defined limits of operation parameters
 - iv. Distribution System occurred and anticipated events
- III.8.6.3 DSO shall observe the Distribution System through its information and telecommunication system, typical for data collection, elaboration and transmission and necessary commands for the management of the Distribution System. The Central Dispatch Centre has the authority to issue orders for the DSO while the DSO issues orders to Distribution System Users referring to Distribution System working regime of equipment and installments.
- III.8.6.4 Orders of Central Dispatch Centre shall be promptly applied unless staff safety and equipment integrity are in danger. DSO shall issue orders on coordination and maneuvering issues in conformity with effective rules. The operative staff shall execute maneuvers according to specific technical norms and safety rules.
- III.8.6.5 DSO has the obligation and authority to undertake all necessary measures to limit the enlargement of breakdowns and maintain normal operation terms in case of a turbulent operation condition due to orders issued by the Central Dispatch Centre.
- III.8.6.6 Under breakdown circumstances, the DSO has the right to limit the consumption by manual switch off in conformity with norms or orders of the Dispatch Centre in order to maintain Power System normal operation condition.

III.9 EVENT REPORTING

- III.9.1.1 The Distribution Code sets out the requirements for reporting in writing the events.

- III.9.1.2 Information between the DSO and the users of the Distribution System shall be exchanged on the reasonable request of both parties.
- III.9.1.3 The objective of this paragraph is to facilitate the provision of more detailed information in writing and where agreed between the DSO and the users of the Distribution System involved, joint investigation of those Significant Incidents reported verbally. Requirements apply to all main users of the Distribution System and DSO. The main users of the Distribution System shall appoint representatives and establish communication channels to provide communication between them.
- III.9.1.4 Communication shall, as far as possible, be directed between the users of the Distribution System involved in event and the DSO. However, this does not preclude communication with the users' nominated representative.
- III.9.1.5 A report in writing or in electronic form shall be submitted to the DSO or the users of the Distribution System, as it will be the case. The report shall contain the notification together with more details relating to the significant incident including information which has become known relating to the significant incident since the notification.

III.9.2 *Joint Investigation*

- III.9.2.1 In case a significant Incident or breakdown has been declared and a report has been submitted, the DSO or users of the Distribution System may request in writing that a joint investigation be carried out. An investigative panel shall be necessary for the incident or the breakdown to be investigated with the agreement of all parties involved.
- III.9.2.2 A joint investigation shall take place where all parties affected by it agree on. The form and rules of, and procedures for, and any other matter relating to the joint investigation shall be agreed in the joint investigation agreement. In the absence of such an agreement the joint investigation shall not take place, but an investigation shall be carried out by responsible organs authorized by the law.
- III.9.2.3 Matters in written report of a significant incident should include:
 - i. Date and time of significant incident
 - ii. Location
 - iii. Equipment involved
 - iv. Brief description of significant incident
 - v. Details of any control undertaken
 - vi. Conclusions and recommendations if applicable
 - vii. Duration of incident
 - viii. Estimated date and time of return to normal service

- III.9.2.4 For the generator connected to the Distribution System matters in written report of a significant incident should include:
- i. Interrupted Generation;
 - ii. MVAR performance;
 - iii. Estimated date of the return to normal service.

III.9.3 System Tests

- III.9.3.1 The Distribution Code sets out the responsibilities and procedures for arranging and carrying out system tests. System tests are those tests which involve either simulated or controlled application of unusual or extreme conditions on the Distribution System, but which do not include commissioning or re-commissioning tests or any other tests of a minor nature.
- III.9.4.1 ***The objectives of the Distribution Code requirements regarding system tests are:***
- i. To ensure that the procedures for arranging and carrying out system tests do not threaten the safety of personnel or of the general public and cause minimum threat to the security of supplies, the integrity of generating units or equipment and are not disadvantageous to the DSO and users of the Distribution System;
 - ii. To set out procedures to be followed for establishing and reporting system tests
- III.9.4.2 Requirements apply to all main users of the Distribution System
- III.9.4.3 If the system test is proposed by the DSO or the user connected to the Distribution System and the test will or may have an effect on the OST Transmission System the provisions of the Grid Code shall apply.
- III.9.4.4 When the DSO or a user of the Distribution System intend to undertake a system test which may have significant effect on other systems, normally six months notice shall be given by the person proposing the system test to the DSO and to those user of the Distribution System who may be affected by such a system test.
- III.9.4.5 The proposal shall be in writing and shall contain details of the nature and purpose of the proposed system test and shall indicate the extent and situation of the installations or apparatus involved. If the information set out in the proposal notice is considered insufficient by the DSO then the DSO shall contact the person proposing test with a written request for further information which shall be supplied as soon as practically possible.

- III.9.4.6 If the DSO wishes to undertake a system test, the DSO shall submit a proposal of that system test to the respective user. The DSO shall coordinate the Distribution System test, using the information provided to it, and shall identify, which users may be affected by the proposed system test. Following receipt of the system test proposal the DSO shall evaluate the impact of the system test and discuss the proposals with users of the Distribution System identified as being affected.
- III.9.4.7 Within one month from receiving the system test proposal, the DSO shall submit a report to the applicant containing:
- i. Proposals for carrying out the system test
 - ii. The manner it will be monitored
 - iii. Allocation of costs between the affected parties
 - iv. The general principle that the person proposing system test will bear the costs
 - v. Other matters that the DSO consider appropriate; report outlines the procedure to be followed and the proposed test schedule and advise of any costs
- III.9.4.8 The proposal report shall be submitted to all those who received a notice. If the proposal report agreed between the DSO and the person proposing system test is approved by all recipients, the system test can proceed.
- III.9.4.9 At least one month prior to the date of the proposed system test, the DSO shall submit to all recipients of the proposal notice a program which shall be called a final test program stating the proposed timings, a list of those staff involved in carrying out the system test and responsible for site safety and other matters as the DSO considers appropriate. The final test program shall bind all recipients to act in accordance with the provisions contained within the program in relation to the proposed system test.
- III.9.4.10 At the conclusion of the system test, the person proposing system test shall be responsible for preparing a written report on the system test for submission to the DSO.
- III.9.4.11 The final report shall include a description of the generator and/or apparatus tested together with the results, conclusions and recommendation. Results of the test shall be reported to relevant parties, taking into account confidentiality issues. All system test procedures shall comply with all applicable legislation.

III.9.5 *Monitoring of the Distribution System and Investigation of the Users Installations*

- III.9.5.1 In order to properly exercise its responsibilities in respect of safe, secure and economic operation of the Distribution System and complying with its license

conditions, the DSO shall organize and carry out monitoring and testing of users' generators or electrical installation on the Distribution System.

- III.9.5.2 The objective of this section is to specify the DSO requirements to test and/or monitor the Distribution System to ensure that users are not operating outside technical parameters required by the Distribution Code. Requirements apply to all main users of the Distribution System. The DSO shall, from time to time, determine the need to test or monitor the quality of supply at various points on the Distribution System. The requirement for specific testing and/or monitoring may be initiated by the receipt of specific complaints as to the quality of supply on the Distribution System. Where testing or monitoring is required at the connection point with a user of the Distribution System, the DSO shall inform the user involved and shall make available the results of such tests to the user together with related recommendations.
- III.9.5.3 When a user is found to be operating outside the technical limits specified in the Distribution Code then the user shall correct the situation or disconnect the apparatus causing the problem from its electrical system connected to the Distribution System immediately or within such time as agreed with the DSO.
- III.9.5.4 Continued failure to correct the situation shall result in the user being disconnected in accordance with the Connection Agreement. The DSO shall, from time to time, monitor the effects of the users of the Distribution System on the Distribution System. The monitoring shall normally be related to the:
 - i. Amount of active power
 - ii. Reactive power or flickers
 - iii. Harmonics transferred across the connection point
 - iv. Where the user is exporting or importing active power or reactive power in excess of those defined in the Connection Agreement or causing disturbances, the DSO shall notify the user and the user shall restrict the power transfer to within the specified parameters
 - v. The DSO can check from time to time that users connected to the Distribution System are in compliance with agreed protection requirements and protection settings

III.10 SAFETY COORDINATION

- III.10.1 The Distribution Code specifies the safety management system criteria to be applied by the DSO to meet legal requirements and the distribution license terms and conditions.
- III.10.2 Similar criteria and standards of safety management systems shall be provided by other users of the Distribution System when carrying out

work or tests at the operational interface with the DSO. The safety coordination lay down the safety management criteria to be applied to ensure safety of persons working in the Distribution System and at or across operational and ownership boundaries. The safety coordination specifies the safety management system criteria that apply to the DSO and the main users of the Distribution System.

- III.10.3 The safety management principles and procedures (Safety Management System) for ensuring the health and safety of all relevant personnel shall be specified by the DSO and respective related users, according to the legislation in force.
- III.10.4 There shall be joint agreement by the DSO and users on which Safety Management System is to be used for sites or locations where an operational boundary exists, and proper documentation of the safety precautions to be taken shall be maintained. The DSO shall provide written authorization to personnel doing the work of control, operation, and work or testing of sites or apparatus connected to the Distribution System. There shall be joint agreement between the DSO and users, which specifies responsibility for system or control equipment, which shall ensure that only one party is responsible for any item of site or apparatus at any one time.
- III.10.5 The DSO and each user shall, at all times, have nominated a person or persons responsible for the coordination of safety in the respective systems. The DSO and each user shall maintain a suitable system of documentation which records all relevant operational events that have taken place on the Distribution System or other system connected to it and the co-ordination of relevant safety precautions for work. Electric schemes showing sufficient information for controlling personnel to carry out their duties shall be exchanged between the DSO and user.
- III.10.6 The following procedure establishes the basic safety requirements of exchange between users and DSO. These procedures are necessary for the safety of all who may have to work at either side of the interface or on the interface. Written rules for safe working and communicating procedures shall be available and used by all persons who may have to work at or use the facilities at the interface.
- III.10.7 Electrical equipment connected to either side of the interface and interface equipment shall be under the control of a named person at either side. Adequate means of isolation shall be provided at the interface to allow work to be carried out safely at either side of the interface. Where necessary to prevent danger, adequate facilities for earthing shall be provided at either side of the interface to allow work to be carried out safely at the interface or at either side of the interface.
- III.10.8 For equipments placed near to each other, which operation is being done in circumstances which may cause danger adequate working space, adequate

access means and, where necessary, adequate lighting shall be provided. All electrical equipment shall be properly identified when it is necessary to prevent danger.

- III.10.9 Electrical installations and equipment shall comply with the effective legal requirements.
- III.10.10 Operation and maintenance of the users' equipment shall only be carried out by authorized personnel. Before first commissioning of the plant, operating procedures shall be agreed with the DSO. Information for operating and/or earthing the users' electrical equipment shall be clearly displayed in the users' medium and low voltage switch room. The safety rules detail the safety procedures and technical safety requirements to be observed by all personnel working in the Distribution System.

III.11 SECURITY OF SUPPLY AND PERFORMANCE STANDARDS FOR THE ELECTRICITY DISTRIBUTION SERVICE

III.11.1 *Application Area*

- III.11.1.1 The application of performance standards of electricity distribution service establishes the indicators and performance levels for:
- i. Connection of users to the Distribution System
 - ii. Safety, reliability of supply as well as the quality of distributed electricity
 - iii. Scheduled interruptions due to programmed maintenance and repair works
 - iv. Unscheduled interruptions due to different breakdowns and defects
 - v. Solution of users complains on electricity quality
 - vi. Solution of users complains
- III.11.1.2 These standards shall be applied for the relations between the DSO and users of the Distribution System, when:
- i. They have installations in alternative nominal voltage in the range of 0.4 kV \geq 110 kV and frequency of 50 Hz
 - ii. They do not cause supply disturbances to other users of the Distribution System through their working regime
 - iii. They remain within the maximal power established by technical approval for connection and observation of terms provided in the contract
- III.11.1.3 These standards shall not be applied in the following occasions:
- i. Force Majeure events
 - ii. Abnormal operation of the Distribution System as defined by the DSO
 - iii. Accidental events caused by third parties

III.11.2 Attributes and Competences

III.11.2.1 In order to observe the performance standards, the DSO should provide:

- i. Capacity to solve complaints and petitions of users of the Distribution System according to this Distribution Code and the legislation in force
- ii. Records of the applications for connection to the network and notices issued for the technical acceptance of connection
- iii. Records of the activity performance regarding the quality of electricity distributed to users of the Distribution System
- iv. Planning of programmed works for maintenance and repair
- v. Continuity of distribution services performed by the users

III.11.3 Performance Indicator for Electricity Distribution Activity

III.11.3.1 The DSO responsibility regarding the supply of Distribution System users terminates at boundary points of installations between parties as specified by the distribution service contract. Place and numbers of boundary points shall be proposed by the DSO and shall be established by mutual agreements with the user of the Transmission System.

III.11.4 Electricity Supply Interruptions - Accidental Interruptions

III.11.4.1 The DSO shall restore, as soon as possible, the supply of the Distribution System customers affected by the accidental event that resulted in the supply interruption. The DSO shall file all complaints and inform the complainant on the file number. Any complaint should refer to the filed number.

III.11.4.2 The DSO should inform the complainant on the approximate period of interruption and the restoration of supply. The DSO should send emergency equips to eliminate the breakdown within minimal time.

3.11.5 Security of Supply

III.11.5.1 The DSO shall use reasonable actions to preserve the security of supply from the system for its customers. This cannot be ensured, since faults, planned maintenance and new works outages and other circumstances outside DSO's control can cause interruptions. On such occasions, the DSO shall use reasonable actions to restore the supply or connection as soon as practicable.

III.11.5.2 Types of interruptions are:

- i. **Fault Outages:** The DSO shall make an effort to restore electricity supply to its customers according to the paragraphs of this Distribution Code. In

specific circumstances the outage duration may be longer and, in such circumstances, the DSO shall act to keep the user of the Distribution System informed of progress.

- ii. **Planned Outages:** The DSO shall notify the necessary interruptions for planned maintenance and repairing. The DSO shall make the notification through public information means, depending on the size of the affected area, at least 24 hours in advance, informing also the outage duration. For planned outages, not notified in advance, the users of the Distribution System may complain, while the DSO shall be due to repair related damages according to the distribution contract.
- iii. **Supply Curtailments:** In some circumstances, it may be necessary to request customers to reduce load or to use standby supplies where appropriate. In these situations the DSO shall make an effort to maintain access to the Distribution System and inform the Distribution System users on supply curtailments 24 hours in advance in the affected areas.
- iv. **Load Shedding:** In situations of generation shortages, load shedding may be required. In these circumstances the DSO shall notify customers if possible.

III.11.5.3 The DSO may disconnect users under certain circumstances. These circumstances shall include:

- i. When the customer's installation or use of electricity is such as to impede with the acceptable operation of the Distribution or Transmission Systems or to cause disturbance to other users of the Distribution System
- ii. When the DSO considers that the customer's installation is in a dangerous condition
- iii. When repairs, replaces or maintains the Distribution System and the switching off of the connection point is required
- iv. When a user of the Distribution System extends supply for use by another party
- v. In any other circumstances in which disconnection is necessary or appropriate to enable the DSO to comply with the Distribution Code and/or to operate the Distribution System in accordance with effective rules, directives, norms, regulations or laws.

III.11.6 *Indicators of Annual Performance*

III.11.6.1 Indicators of annual performance of the Distribution System consist in:

- i. Number of programmed interruptions according to voltage levels
- ii. Total duration of scheduled interruptions according to voltage levels
- iii. Number of users affected by interruptions in time limits according to voltage levels and customer categories
- iv. Number of incidents and breakdowns

- v. Duration of interruptions due to incidents and breakdowns according to voltage levels

III.11.6.2 When a complaint is submitted regarding the voltage level, the DSO shall verify this parameter in boundaries with the user of the Distribution System and inform the user on the outcomes of analyses and actions undertaken to fix the problem. The standard time to answer the complaints is 15 calendar days.

III.11.6.3 Complaints shall have a registered number, and complainants shall be informed on this number. Later complaints shall be referred to this registered number.

III.11.7 *Indicators of Annual Performance as to Voltage Level*

III.11.7.1 Indicators of annual performance of the Distribution System as to voltage level consist in:

- i. Number of complaints for voltage levels
- ii. Number of complaints an answer was given
- iii. Number of complaints no solution was given

III.11.8 *Annual Indicators related to Complaints of Distribution System Users*

III.11.8.1 Indicators of annual performance of the Distribution System as to complaints of the Distribution System users:

- i. Number of written complaints
- ii. Number of specified complaints that have been answered
- iii. Number of specified complaints that have not been answered

III.11.8.2 The DSO is obligated to answer (by solving complaint or giving a written answer) to all written complaints from users of the Distribution System. The maximal standard period to answer a complaint is 30 calendar days, unless otherwise defined by this Distribution Code.

III.11.8.3 Any complaint shall have a registered number that shall be communicated to the complainant. Later complaints shall be referred to the registered number.

III.11.9 *Monitoring and Registering of Performance Indicators*

III.11.9.1 For recording of complaints made by users of the Distribution System, the DSO shall organize:

- i. A center for customer relations in each territorial unit registering the complaints
- ii. A telephone service

- iii. A specialized sector for analyzing the complaints
- III.11.9.2 The DSO shall guarantee to monitor other performance indicators through specialized sectors.

III.11.10 *Table of Performance Indicators is in Attachment A*

CHAPTER IV - CONNECTION

The Connection Chapter specifies the terms, criteria and deadlines to be fulfilled by the users of the Distribution System in order to connect to or modify their existing connections to the Distribution System.

IV.1 SCOPE

IV.1.1 The scope of this paragraph is to fulfill the following objectives:

- i. All existing users of the Distribution System or perspective users should be treated equally
- ii. New Connections should not cause any negative effect on the existing users and New Connections should not be influenced by negative effects of the existing users
- iii. Assist the Distribution System users to meet their obligations and provide high quality operation and maintenance of their installments
- iv. Clearly specify in a standard format the obligations and responsibilities of all Distribution System users for every place where a New Connection is made or an existing one modified

IV.2 PROCEDURE OF APPLICATION FOR CONNECTION

IV.2.0.1 Any Distribution System user requiring a new connection or modification of existing connections and/or using the Distribution System should follow the procedures established by this Chapter.

IV.2.0.2 DSO shall follow the procedures and deadlines specified in this Distribution Code in the process of application, modification, acceptance or refusal of a request.

IV.2.1 *Application for Connection*

IV.2.1.1 Any Distribution System user that requires using the Distribution System may submit an Application for Connection to the DSO, in the format required by the DSO.

IV.2.1.1 The request should include at least the following information:

- i. Name, address, phone/fax/e-mail of the applicant
- ii. Scope of the applicant related to the connection (generation unit, distribution installments, load installments, etc)
- iii. Written commitment of the applicant to comply with the Distribution Code

- iv. Documentation attached to the application according to following paragraph specifications

IV.2.2 *Specific information required for getting connected to the low voltage Distribution Network*

IV.2.2.1 For connections at Low Voltage, the DSO requires the following information:

- i. Object name (consumption site)
- ii. Location of the object, address. Location map should be attached if requested by the DSO
- iii. Activity type (production, trade, services, etc.)
- iv. Type of required connection (one or three phases)
- v. Installed capacity in kW
- vi. Electric design of users installments prepared by a licensed electric engineer
- vii. Statement of conformity of user's internal installations
- viii. Maximum kW or kVA requirements
- ix. Annual demand for Electricity in kWh
- x. Type and electrical loading of equipment to be connected (such as number and size of motors, illumination, etc)
- xi. Average power factor of customer work ($\cos\phi$)
- xii. The date when connection is requested

IV.2.2.1 If a preliminary assessment of this data indicates that more detailed information is practically required, then it shall be provided to the DSO upon request by the respective user/customer.

IV.2.3 *Specific information required for connection at High and Medium Voltages*

IV.2.3.1 For connection at High and Medium Voltages the following information will be required:

- i. Object name (consumption site)
- ii. Location of the object, address. Location map should be attached if requested by the DSO
- iii. Activity type (production, services, working methods, shift number, working days in a week, etc.)
- iv. Installed power in MW
- v. Load curve
- vi. Average power factor of customer work ($\cos\phi$)
- vii. Electric design of Users installments prepared by a licensed electric engineer
- viii. Statement of conformity of user's internal installations

- ix. If the user is already connected and requires a modification of the existing connection, it should submit: Actual manner of supply of the object (scheme, characteristics, supply lines and the metering method of consumed electricity). A copy of the Connection Agreement and the scheme of location of supply installments to the existing receiving and metering point should also be provided.
 - x. An annual and a 5-years Maximum and Minimum Reactive Power demand
 - xi. An annual and a 5-years Maximum and Minimum Reactive Electricity demand
 - xii. Type of load and control arrangements (e.g. type of motor start)
 - xiii. Maximum load on each phase
 - xiv. Maximal current harmonics that may be imposed on the Distribution System
 - xv. Details of cyclic load variations or fluctuating loads (as below)
 - xvi. Disturbing Loads
 - xvii. Comprehensive schedule of installed new equipment including details of disturbing loads. These are loads which have the potential to introduce harmonics, flickers or unbalances to the Distribution System
 - xviii. Fluctuating Loads
 - xix. Technical data on equipment that generate/observe reactive power, if there is any
 - xx. Responsibilities for equipment control and maintenance
 - xxi. Date when connection is requested for
- IV.2.3.2 Main users that apply for New Connection should also guarantee:
- i. Responsibilities for equipment control and maintenance
 - ii. Responsibilities for equipment operation
 - iii. Responsibilities for staff and technical safety
- IV.2.3.3 In some cases, more detailed information may be required to permit a full assessment of the effect of the user of the Distribution System load on the Distribution System. Such information may include a proposed commissioning program. This information shall be specifically requested by the DSO if necessary, and shall be provided by the user within a reasonable time.
- IV.2.3.4 User of the Distribution System shall inform the DSO in advance if it is proposed to make any significant change to the connection, electric lines or electric equipment, install or operate any generating equipment or do anything else that could affect the Distribution System or require changes to connection. Users shall provide to the DSO any information reasonably required by the DSO about the nature and use of electrical equipment on the users premises.
- IV.2.3.5 After receiving all the data and information prescribed above, the DSO shall develop the respective study on new connections or modification of existing

connections in medium and high voltage levels. In order to define the place for New Connection, the DSO shall be based on the following factors:

- i. Supply security level
 - ii. Static and dynamic stability of Distribution System Elements
 - iii. Short circuit current level
 - iv. Effect of technical losses in case of Old and New Connections to the Distribution System
 - v. Assessment of New Connection manner to the existing scheme of the Distribution System
 - vi. Assessment of New Connection cost for DSO according to the New Connection version proposed by the Applicant
 - vii. Compliance with New Connection technical terms
 - viii. Compliance with respective paragraphs of the Distribution Code.
- IV.2.3.5 If the analysis indicates that the Connection shall function better in a different voltage level from that proposed by the applicant, then the connection shall be made in the respective voltage level as indicated by the study.

IV.3 . CONNECTION TO THE DISTRIBUTION NETWORK

IV.3.1 The Distribution System Users requiring to connect to the Distribution Network or to modify the existing connection should fulfill the minimal technical criteria of planning and operation in order to maintain a stable and safe operation of the Distribution System. This is also necessary to protect the Plants and installments of the Distribution System and of the Distribution System Users directly connected to the Distribution System.

IV.3.2 *Terms of Connection to the Distribution System*

IV.3.2.1 Terms of Connection to the Distribution System establish minimal principles and standards to perform the Connection, way of connection and technical and performance standards.

IV.3.2.2 The terms of connection should be similar to all Users of the Distribution System for the equivalent categories. The terms of Connection to the Distribution System specify the information to be provided by Users of the Distribution System in order to undertake appropriate actions from the DSO for new connections or modification of the existing connections.

IV.3.2.3 Prospective User of Distribution System shall provide to the DSO in satisfactory time all the information and data prescribed in this Code. In conjunction with the terms of connection, there are Connection Agreements, which are bilateral agreements between the DSO and any User of the Distribution System, and which contain the specific details on each User's

connection to and use of the Distribution System. The Connection Agreement requires the User of the Distribution System and the DSO to comply with the terms of the Distribution Code.

- IV.3.2.4 The terms of connection define the minimum standards for the method of connection to the Distribution System and the technical, design and operational standards to which Users connecting to the Distribution System shall comply. The terms of connection specify the technical arrangements required at the Ownership Boundary between the Distribution System and the Installation of the User of the Distribution System and is applicable at all voltage levels covered by the Distribution Code. The terms of connection outline the types of signals and indications that will be required to be made available to the DSO by each User of the Distribution System. The terms of connection apply to all connected Users of the Distribution System that require the modification of the existing connection, and Users planning a connection to the Distribution System.

IV.3.3 *Connection Agreements*

- IV.3.3.1 During the application for connection the DSO based on the respective study and in consultation with the applicant shall specify the voltage level to which a User of the Distribution System will be connected in accordance with normal practice for the type of load to be supplied and network characteristics.

- IV.3.3.2 The voltage level will be the minimum allowed voltage in standard use on the Distribution System. Based on the information provided by Users to the DSO for connection to the Distribution System, the DSO shall prepare a statement containing the following elements that are necessary for and relevant to the proposed connection:

- i. Nominal voltage at which connection will be made
- ii. Method of connection, extension and/or reinforcement details
- iii. The normal impedance to source at the point of connection
- iv. Method of earthing
- v. Maximum withdrawal capacity of electricity

IV.3.4.1 *Individual customer restrictions relating to:*

- i. Harmonic Distortion
- ii. Voltage Flicker
- iii. Unbalance
- iv. Expected lead time of providing connection (following formal acceptance of terms for Supply)

- v. Cost of connection

IV.3.5 *Ownership Boundaries*

- IV.3.5.1 The point or points at which energy is withdrawn or injected between the Distribution System and User's installation shall be decided between the DSO and the User as to the request. Ownership boundaries shall be established in Connection Agreement and Supply Agreement in order:
 - i. To facilitate maintenance actions of DSO
 - ii. To minimize inconveniences of User of the Distribution System from DSO and Suppliers daily duties
 - iii. To facilitate readings of commercial meters and data convey
 - iv. To enable disconnection and reconnection of network equipment
- IV.3.5.2 For low voltage supplies the DSO responsibility extends up to the Customer's Connection. For High Voltage supplies the ownership boundaries shall be in each case subject to specific agreement between the parties. Changes in the Boundary arrangements proposed by either party shall be agreed in advance.
- IV.3.5.3 All equipment at the Ownership Boundary shall meet the design principles contained in the Planning Chapter. Connections of Users to the Distribution System shall include means of disconnection of the User's installation by the Distribution System.

IV.3.6 *Technical Requirements for Connection*

- IV.3.6.1 A connection to the Distribution System may be by means of an overhead line, an underground cable or a combination of both. The network configuration at the Connection Point may take a number of forms appropriate to the nature of the load and network arrangements.
- IV.3.6.2 All equipment in an installation connected to the Distribution System shall be designed, manufactured, tested and installed in accordance with all applicable legal obligations and shall conform to the relevant CENELEC (European Committee for Electro Technical Standardization) or Albanian Standards up to date at the time of the connection of the installation to the Distribution System. The DSO may notify Users that supplemental specifications and/or standards shall be met.
- IV.3.6.3 All equipment in an installation connected to the Distribution System shall be suitable for use at the operating frequency of the Distribution System and at the voltage and short-circuit rating of the Distribution System, as in Design Chapter of Distribution Code, at the Connection Point. The DSO may require manufacturers' certification that the equipment has been designed and

installed in an acceptable manner. The DSO may also seek evidence that the equipment has been tested for conformance with the international standards.

IV.3.6.4 Before entering into a connection agreement it will be necessary for the DSO to be convincingly satisfied that the User's System at the boundary with the Distribution System shall comply with the appropriate requirements of the Distribution Code.

IV.3.7.1 Protection Requirements

IV.3.7.1.1 User of Distribution System shall make certain that faults in the User's Plant and Apparatus do not cause disturbances to the Distribution System or to other Users. Without limiting this obligation, a User shall prior to connection of the User's Installation to the Distribution System, install the protection equipment

IV.3.7.1.2 Faults on the Distribution System can cause damage to User's Plant and Apparatus. These faults could result in a loss of a phase, over voltage, or under voltage. The User shall take account of the established practices of the particular network to which a connection is to be made, and ensure that protection installed is compatible with that used by the DSO(s). The adequacy of the protection installed by the User of the Distribution System is User's responsibility.

IV.3.7.1.3 User's Protection arrangements at the Ownership Boundary, including types of Equipment and Protection settings, shall be compatible with existing system conditions and the Distribution System protection practice as specified by the DSO at the time of application.

IV.3.7.1.4 Users should be aware that disconnection of one or two phases only of a three phase system may be effected by Distribution Protection arrangements for certain types of faults. The minimum protection required for a User Installation connected to the Distribution System will vary according to type, size, and method of connection and earthing of the User System.

IV.3.7.1.5 New connection may require the following protection amenities:

- i. Three phase over-current
- ii. Earth fault protection
- iii. Other necessary according to circumstances

IV.3.7.1.6 Where interface circuit breakers are used they shall be fitted with relays of a type of acceptable to the DSO(s). These relays shall have three phase

over-current elements and one earth fault element and shall have time-current characteristics. Maximum permissible relay settings at the ownership boundary will be provided by the DSO(s), and these settings may be reviewed at any time in the future by the DSO(s).

IV.3.7.1.7 In order to ensure satisfactory operation of the Distribution System, Protection systems, operating times and sensitivity at the Ownership boundary shall be agreed between the DSO and the User of the Distribution System during the application for connection process, and may be reviewed from time to time by the Distribution Company(s);

IV.3.7.1.8 In order to avoid effects caused from a Circuit Breaker or other nonfunctioning equipment, a back-up protection shall be provided upon the DSO request. Protection relays shall be commissioned on site by the User of the Distribution System who shall guarantee that the settings are below the maximum permitted levels. The DSO can observe these tests and it shall be the responsibility of the User of the Distribution System to ensure that sufficient notice is given to the DSO(s). Users shall ensure that the protection settings remain below the maximum permitted levels.

IV.3.7.2 *Earthing*

IV.3.7.2.1 Earthing of the part of the User's Installation that is connected to the Distribution System shall comply with the requirements of the Distribution Code and legislation in force. Earthing installation of Distribution System shall be designed to comply with rules and legal acts in force.

IV.3.7.2.2 Users of the Distribution System shall take safety measures to limit the occurrence and effects of circulating currents in respect of neutral points connected with earth where there is more than one source of energy.

IV.3.7.3 *Short-Circuit Levels*

IV.3.7.3.1 The short circuit rating of User's Equipment at the connection point shall not be less than the design Fault Level of the Distribution System. The User's of Distribution System incoming supply shall be controlled by a main circuit breaker which shall comply with a recognized international standard acceptable for the Distribution System Operator.

IV.3.7.4 *Insulation Levels*

IV.3.7.4.1 The design of equipment connected to the Distribution System shall be such as to enable it to survive the AC and impulse tests

IV.3.7.5 *Capacitive and Inductive Effects*

IV.3.7.5.1 The User of the Distribution System shall provide the DSO with information of any capacitor banks and reactors connected at High Voltage and/or Medium Voltage, which could affect the Distribution System.

IV.3.7.6 *Voltage Disturbances*

IV.3.7.6.1 Users of the Distribution System should not generate voltage disturbances at a level that would affect other Users connected to the Distribution System. Users should select equipment that is capable of functioning satisfactorily in the presence of disturbances at the levels permitted by international standards.

IV.3.7.7 *Metering and Telemetry*

IV.3.7.7.1 The User may be required to provide such voltage, current, frequency, Active Power and Reactive Power indications of the measuring that are essential for the DSO to ensure adequate System monitoring. Details will be specified in the Connection Agreement.

IV.3.7.7.2 If agreed by the parties that the DSO shall control the switchgear on the User's System, the DSO shall install the necessary remote control station. Responsibility of the User of the Distribution System is to provide the necessary control interface for the switchgear of the User, which are subject of control.

IV.3.7.7.3 Personnel carrying out the designing or installation work for the customer interface with the DSO should comply with principles of the Distribution Code.

IV.3.7.8 *Specific Rules for Distributed Generators*

IV.3.7.8.1 The integrity of the Distribution System and the security and quality of supply to existing Users of Distribution System shall not fall below standard as a result of generators operating synchronized with the Distribution System. Conditions for operation shall guarantee the safety of:

- i. General public
- ii. Personnel
- iii. Equipment of the Distribution System and Users of the Distribution System

IV.3.7.8.2 Generation Units connecting to the Distribution System and operating in parallel with, or which are capable of being operated in parallel with the Distribution System shall comply with requirements for Connection of Distributed Generators. This Code sets out the conditions to which Distributed Generating Units operating in parallel to the Distribution

System shall comply. The Distributed Generator is responsible for protection of its personnel and equipment and the efficient operation of his Generating Unit.

IV.3.7.8.3 DSO shall be informed where a Generator Unit is to be installed. The DSO shall have the right to inspect generating installations to ensure that the requirements are met. In some cases the DSO may require a demonstration or testing of operation of the generator. Such demonstrations and tests shall be performed according to the agreement with the Generator.

IV.3.8 Provision of the Information

IV.3.8.1 DSO before entering into an agreement to connect any Distributed Generators Plant to the system may require the following information.

IV.3.8.2 Generating Units

IV.3.8.2.1 Generators' Parameters

- i. Nominal Voltage (U_n in kV)
- ii. Full Nominal Power (S_n in MVA)
- iii. Nominal Active Power (P_n in MW)
- iv. Phase Nominal Current (I_n in A)
- v. Nominal Power Factor ($\cos\phi$)
- vi. Nominal Frequency (F_n in Hz)
- vii. Nominal Speed (N_n in rot/min)
- viii. Inertia Constant H (MW Sec/MVA)
- ix. Volant Moment (GD^2 in Tm^2)
- x. Short Circuit Coefficient (K_c)
- xi. Synchronous Long Reactance (X_d in p.u.)
- xii. Temporary Long Reactance (X'_d in p.u.)
- xiii. Super-Temporary Long Reactance (X''_d in p.u.)
- xiv. Oblique Synchronous Reactance (X_q in p.u.)
- xv. Oblique Temporary Reactance (X'_q in p.u.)
- xvi. Oblique Super-Temporary Reactance (X''_q in p.u.)
- xvii. Resistance of Stator per phase in 75°C (R_a in Ω)
- xviii. Constant of temporary time for winding of open stator (T'_{do} per sec)
- xix. Constant of Over-Temporary time along length axes for winding of the open stator (T''_{do} per sec)
- xx. Constant of oblique temporary time for open circuit (T'_{qo} per sec)
- xxi. Constant of oblique over temporary time for open circuit (T''_{qo} per sec)

- xxii. Constant of winding time of the stator connected to short circuit (T_s per sec)
- xxiii. Curve of Open Circuit Fed up
- xxiv. Curve of Generators Capacity.

IV.3.8.2.2 **Parameters of Exciting System and Automatic Voltage Regulator (RAT)**

- i. Type of Exciter
- ii. Nominal Current of Exciter (I_n in A)
- iii. Nominal Voltage of Exciter (U in V)
- iv. Exciter maximal Current along Transient Time (I_{max} in A)
- v. Exciter maximal Voltage (V_{max} in V)
- vi. Excitation System Transient Response
- vii. Excitation System Open-Loop Response characteristic
- viii. Excitation System closed loop Response characteristic
- ix. Dynamic characteristics of over exciting and limits
- x. Dynamic characteristics of under exciting and limits
- xi. Detailed structured scheme of the whole exciting system that shows details of transmitting functions and parameters of its elements.

K_a – Voltage Regulator Constant

T_a – Voltage Regulator Time Constant

V_{rmax} – Normal Max voltage in exit

V_{amax}, V_{amin} – Maximal and Minimal Voltage of Internal Regulator

IV.3.8.2.3 **Parameters of Regulation and Speed Regulators**

- i. Type of Speed Regulator,
- ii. Coefficient k_g that defines the range of work of the speed regulator (in MW/Hz) as defined by IEEE norms;
- iii. Speed and its time constant (T_{sr})
- iv. Time constant of servomotor and Guiding Apparatus (T_{sm})
- v. Opening valve of the speed regulator with limit number (Cv. OPEN)
- vi. Closing valve of the speed regulator with limit number (Cv. CLOSE)
- vii. Limit of speed regulator valve (CvMax. and CvMin)
- viii. Based on the steam turbine system in CR-IEEE the following parameters should be provided when appropriate:
 - a) TRH, TRH1 – Time Constant of Over-Warming up (first stage)
 - b) TRH2 – Time Constant of Over-Warming up (second stage)
- ix. Structural Scheme of the Regulator System and Speed Regulator indicate the transmitting functions of specific elements.

IV.3.8.3 Transformer Parameters in Generating Units:

- i. Nominal Power MVA
- ii. Nominal Voltage kV
- iii. Connection Group
- iv. Losses in Pcu load in kW
- v. Voltage of short circuit Uk in %
- vi. Losses without Po load in kW
- vii. Current of work without Io load in %
- viii. Reactance of Correct Order (for maximal, minimal and normal position of xx) (% of MVA)
- ix. Resistance of Correct Order (for maximal, minimal and normal position of xx) (% of MVA)
- x. Reactance of Null Order (% of MVA)
- xi. Level of Voltage Regulation ($\pm\%$) and steps
- xii. Type of Voltage Regulation (off-load/on-load)

IV.3.9 Interface Arrangements

- IV.3.9.1 These agreements define details for connecting with earth of Distributed Generators Plant directly connected to the Distribution System and other specifications that might be requested according to generation unit connections to the Distribution System. The details of information required will vary depending on the type and size of the Generating Unit or the point at which connection is to be made to the Distribution System. This information shall be provided by the Generator upon the reasonable request of the DSO.
- IV.3.9.2 The DSO will use the information provided to model the Generator Unit to determine a technically acceptable method of connection. If the DSO reasonably concludes that the nature of the proposed connection or changes to an existing connection requires more detailed analysis then further specified information may be required.
- IV.3.9.3 In normal circumstances the information specified above will enable the DSO to assess the connection requirements. Occasionally additional information may be required. In such circumstances, the information shall be made available by the Distributed Generators upon the reasonable request of the DSO.

IV.3.10 Information provided by the DSO

- IV.3.10.1 DSO shall prepare a statement for the Distributed Generators applying for connection to the Distribution System. In case of power export, the following additional information shall be provided:
- i. Interface protection settings
 - ii. Equipment, cabling, switchgear, metering requirements
 - iii. Substation site and building requirements (dimensions, access, planning permission, earthing, lighting and heating)

IV.3.11 Distributed Generators Plant Performance Requirements

- IV.3.11.1 For Distributed Generators not subject to central dispatching the electrical parameters to be achieved at the Generating Unit terminals shall be specified by the Distribution Companies with the offer for connection. Protection associated with Distributed Generator's Plant shall be required to co-ordinate with the Distribution System protection system regarding:
- i. clearance times for fault currents
 - ii. co-ordination with auto re-closer requirements
 - iii. protection settings of the controlling circuit breaker
- IV.3.11.2 Protection settings shall not be changed without agreement from the Distribution Companies. The emission limit for voltage fluctuations and flicker caused by switching or continuous operation of wind / other type turbine installations is $P_{st} = 0.35$ and $P_{lt} = 0.35$ where:
- i. P_{st} : Short Term Flicker Severity - an index of visual severity evaluated over a 10 minute period.
 - ii. P_{lt} : Long Term Flicker Severity - an index of visual severity evaluated over a 2 hour period.
- IV.3.11.3 For generators the Voltage Level Total Harmonic Voltage Distortion is (%):
- i. 0,4 kV = 2.5
 - ii. 10 kV = 2.0
 - iii. 20 kV = 2.0
 - iv. 35 kV = 1.5
- IV.3.11.4 A schedule of individual harmonic distortion limits shall be provided by the DSO where appropriate.

IV.3.12 Islanding

- IV.3.12.1 It is conceivable that a part of the Distribution System, to which Distributed Generator are connected can, during emergency conditions, become

detached from the rest of the System. DSO may decide, dependent on local network conditions, if it is desirable for the Distributed Generator to continue to generate onto the islanded section of the Distribution System.

IV.3.12.2 If facilities do not exist for the subsequent re-synchronization with the rest of the Distribution System then the Distributed Generator shall under DSO instruction ensure that the Generating Plant is disconnected for re-synchronization.

IV.3.12.3 Under emergency conditions there is an expectation that some generation will continue to operate outside the statutory frequency limits. However, for Distributed Generators connected to the Distribution System it is likely that this could mean connection within an automatic low frequency load disconnection zone. Distributed Generator should ensure that all Protection on Generating Plant should have settings to co-ordinate with those on the low frequency load disconnection equipment which will be detailed by the DSO on request.

IV.3.13 *Black Start Capability*

IV.3.13.1 Distributed Generator shall notify the DSO if its Generating Plant has a restart capability without connection to an external power supply, unless the Distributed Generator has previously notified the Transmission System Operator accordingly under the Transmission Grid Code.

IV.3.14 *Generating Plant Commissioning Tests*

IV.3.14.1 Where the Generating Plant requires connection to the Distribution System in advance of the commissioning date, for the purposes of testing, the Generator shall comply with the requirements of the Connection Agreement.

IV.3.15.2 The Distributed Generator shall provide the DSO with a commissioning program, approved consequently by the DSO(s), to allow Commissioning Tests to be co - coordinated.

IV.3.16 *Standby Generators*

IV.3.16.2 Parallel operation with the Distribution System is generally not permitted for standby generators. Specific agreement of the DSO is required for parallel operation.

IV.3.16.2 Customers with standby generation shall ensure that any part of the installation supplied by the generating plant has first been disconnected from the Distribution System and remains disconnected while the generating plant is connected to the installation. Methods of change-over and

inter-locking shall meet Supplementary Requirements for Low Voltage Synchronous Generator Installations.

CHAPTER V - FINAL PROVISIONS

- V. 1 Electricity Distribution Code is object of review with the decision of the ERE
- V. 2 This Distribution Code enters in force 15 days after the publication in the Official Journal

Attachment B**Terms and Definitions for Albania Distribution Code**

TERM	DEFINITION
AC	Alternating Current
Access to the Distribution System	Right of economic subjects that generate or supply electricity and right of electricity customers to connect and use the distribution network services, according to the legislation in force
Active Electricity (Wh)	Active electricity is the active power generated or passing in an electric circuit during a time interval, with the defined integral of the active power being in time limits. Metered with Watt-Hour unit or standard multiplications: 1000 Wh = 1 kWh 1000 kWh = 1 MWh 1000 MWh = 1 GWh 1000 GWh = 1 TWh = 10^{12} Wh
Active Power (W)	The product of voltage and current and $\cos\phi$ of the angle between them. $P = (U \times I) \times \cos\phi$. Metered with Watt (W) unit or standard multiplications: 1000 W = 1 kW 1000 kW = 1 MW 1000 MW = 1 GW 1000 GW = 1 TW = 10^{12} W
Applications for connection to the Distribution System	Documents filled by potential Users that require access for connection to the Distribution System, or by existing User to modify the existing connection. In order to receive the DSO approval for connection, documents are prepared according to the Code provisions.
AVR	Automatic Voltage Regulation
Back-up Protection	A Protection system which will open a Circuit Breaker or other fault-current interrupting device in the absence of the current Protection operation of another Protection system
Black Start	The procedure necessary for a recovery from a Total or a Partial System Shutdown
Circuit Breaker	A mechanical switching device, capable of carrying and breaking currents under normal circuit conditions and also of carrying for specified time and breaking currents under specified abnormal circuit conditions, such as those of short circuit
Commissioning	The final process of testing part of a System prior to that part of the System being considered suitable for normal use
Connection Agreement.	An agreement between the DSO and each User or/and any Customer setting out the terms relating to a connection with the distribution system

TERM	DEFINITION
Connection point	The physical point at which a User's installment is joined to the distribution system
DC	Direct Current
Demand	Unless otherwise stated, the demand expressed in MW or MVAR of Active Power and Reactive Power respectively
Disconnecter	A device which provides in the open position a clear disconnection of an electric circuit
Dispute Procedures	Procedures described by the Distribution Code to solve disputes between DSO and customers
Distribution Code	<p>a. A code required to be prepared for DSO and Retail Public Supplier and approved by the ERE. May be revised from time to time with the approval or by direction of the ERE.</p> <p>b. Is the set of technical rules that regulates the functioning of the distribution network and defines the standard deadlines and service terms between the customers and the DSO(s)</p>
Distribution System	The distribution system includes busbars, switching equipment and transformers in 110/35/20/10 kV substations and all elements in less than 110 kV voltage level owned by DSO(s)
Distribution System Applicants	Legal person, current or future user of the distribution system applying for permission to connect to or modify the existing connection to the distribution system
Disturbing Loads	Loads which have the potential to introduce harmonics, flickers or unbalances into the system
Earthing	A way of providing a connection between conductors or electric equipments and earth through an earthing device
Earthing Device	A means of providing a connection between a conductor or an electric equipment and earth of adequate strength and capability for the intended purpose
Event	An unpredicted occurrence relating to the power system that causes breakdown of system operation and service parameters
Event Circumstances	Operation circumstances for a special electric installation with one or more breakdowns that damage the distribution system operation or interrupt the electricity supply
Flicker	Impression of unsteadiness of visual sensation induced by a light stimulus whose luminance or spectral distribution fluctuates with time
Harmonics	Sinusoidal currents with a frequency equal to integer multipliers of nominal frequency.
High Voltage	High voltage at a level of 110 kV or above.
IEC	International Electrotechnical Commission

TERM	DEFINITION
Incidents (Breakdowns)	The incident (breakdown) is an event that occurs due to internal and external reasons and causes the breakdown of electricity parameters or the interruption for a specified period of time of one or more elements that on the other side lead to electricity supply interruption
Independent Power Producers	Power producer connected to the transmission system. All Albanian producers other than the Public Generation Company are IPPs.
Injection from the Transmission Grid	Delivery of electricity to the distribution system from the transmission system through their interface points
Installed Capacity	Nominal capacity of the active power supplied by plant based on producers documentation (certificate) written in the respective label (passport)
Interruptions due to Breakdown in the Power System	Interruption of electricity supply due to breakdown of power system elements (such as lines, substation transformer, generating unit, etc).
Isolated	Disconnected from associated equipment by a disconnecter or adequate physical separation
kVA	Kilovolt-ampere
Load	Load means a technical indicator in MW that indicates the participation of one or more equipment or customers connected to the electric system
Load Curve	Load progress during each hour (00 –24 hours) for one day, or another period for a specified element
Low Voltage	Low Voltage under 1 kV
Main User	Main users are: Generators with installed capacity over 100 kW directly connected to the Distribution System as well as all customers connected to the Distribution System in medium voltage
Maintenance	Coordination of all technical and organizational actions performed on power system elements during the maintenance period in order to recover their performing capacities for designed functions
Maximal Power	Maximal potential power supplied by the electricity plant under specific mechanical and electrical conditions.
Medium Voltage	Medium voltage from 35 kV to 1 kV
Metering Point	Metering Point is the physical point where the metering system is installed and where the metering system fulfills all technical and accuracy conditions according to the Metering Code. The physical metering point is determined by the agreements between parties.
Nominal Frequency	Number of cycles of alternative current per second expressed in Hertz in the normal operation frequency of the system; 50 Hertz

TERM	DEFINITION
Norms	Standards, codes, rules, decisions and other normative documents established by laws, by-legal acts, regulations, orders, other official documents and contracts
Operation	A scheduled or planned action relating to the operation of the system
Operative Action	Action from the unit receiving the operative order issued by the OST System Dispatch Operator or Regional Dispatch Center as well as programmed actions from the parties affecting the power system functioning
Operative Order	Mandatory order for the receiving unit issued by the OST System Dispatch Operator according to regulations in force. Orders are transmitted by phone, phonograms and fax or after the installation of SCADA system through digital messages.
Ownership Boundary	The electrical boundary between the distribution system and equipment owned by the user
Peak Load (MW)	Maximum of load value in MW registered within a specific time period
Planned Outage	An outage of electricity supply due to the lack of generation, overload of power system or part of distribution system
Plant	Fixed and movable items used in the generation and/or supply and/or transmission of electricity
Point of Common	The point on the distribution system which is electrically nearest to the connection point and from which other customers' loads are, or may be, connected
Power Distributor	Any person or legal subject holding the Distribution license according to the legislation, with a voltage level lower than 110 kV.
Power Factor	Ratio of active electric power (W) with absolute electric power (VA) ($\cos\varphi$). The allowed minimal value of $\cos\varphi$ is 0.9.
Power Sector	The unity of planning, development, construction, use, and maintenance activity to install Generation, Transmission, Distribution plants, systems/objects of Eligible Customers, Electricity Suppliers and Interconnection Lines for import-export and exchanges with neighboring countries
Power Sector Objects	A set of facilities, buildings and different equipment designed for Electricity Generation, Transmission and Distribution.
Protection	The provisions for detecting abnormal conditions in a system and initiating fault clearance or actuating signals or indications or disconnection of the breakdown element

TERM	DEFINITION
Reactive Electricity (VArh)	<p>The Reactive Electricity is the defined integral with time limits of reactive power metered with volt-Ampere reactive hour unit or standard multiplications:</p> <p>1000 VArh = 1 kVArh 1000 kVArh = 1 MVarh 1000 MVarh = 1 GVarh 1000 GVarh = 1 GVarh = 10^{12}VArh</p> <p>The product of voltage and current and $\sin\phi$ of the angle between them. $Q = (U \times I) \times \sin\phi$.</p> <p>Metered with volt-ampere reactive unit or standard multiplications:</p>
Reactive Power (VAr)	<p>1000 VAr = 1 kVAr 1000 kVAr = 1 MVar 1000 MVar = 1 GVar 1000 GVar = 1 TVAr = 10^{12}VAr</p>
SCADA	Supervisory Control and Data Acquisition
Short Circuit	The short circuit occurs due to different damages or wrong actions that connect the elements between two points with different potentials
Short Circuit Current	Currents circulating in a short circuit in a specified point in the System expressed in kA
Supplier	A person authorized by license to supply electricity to the customers based on the legislation
Switch off	Physical act of separation of users objects/systems from the distribution system
Technical Losses	Technical losses of a network element that are equal to the difference between Electricity injected in the element and Electricity exiting from the element
Technical Permission for Connection	Document issued by the DSO that allows the connection of the applicant to the distribution system
Transformation Station (Substation)	Electric facilities, which function is to transform and transfer electricity from one network to another with different voltage levels
Transmission Supply Point	A point of connection between the transmission system and the distribution system or between the transmission system and a customer directly connected to the transmission system
Users of Distribution System	Suppliers, Qualified Suppliers, Auto-producers connected to the Distribution Network, End-users and Eligible Customers directly connected to the Distribution Network as well as other physical or legal persons benefiting from distribution network services.
Voltage Fluctuations	A series of rapid voltage changes which may be regular or irregular.

Attachment C

**Terms and Definitions for Albania Market Rules
and
for Grid Code, Metering Code and Distribution Code**

TERMS	DEFINITIONS
Ancillary Services	All services necessary for the operation of a transmission or distribution system. Ancillary Services include: i. Compensation of reactive power from the Users to maintain standard levels of voltage and reduce network losses. ii. Regulation of active power frequency and related reserves iii. Compensation for engagements and allocation of capacities in the interconnection lines
Auto-producer	An entity generating electric power of which at least 70% is directly used by the producer
Balancing market	A competitive market for bids and offers to provide balancing energy to ensure a real-time system balance in each hour
Balancing service	A service provided by a transmission system operator to compensate for imbalances of market participants
Buyer	Means any market participant that purchase electricity from other market participants
Cogeneration	The combined production of useful electrical and thermal energy, which results in a significant energy saving compare to separated production
Curtailement List	is a list of customer(s), group of customer(s), distribution zone(s) or DSO(s) included in the Curtailement Plan
Curtailement or Load reduction	A procedure to reduce load to meet resource constraints as applied to: customer(s), group of customers, distribution zone(s), DSO(s) and/or the entire power system
Curtailement Plan	A plan developed by the DSO to reduce load during the capacity shortage operated by the Dispatch Centre
Customers	Wholesale and final customers of electricity
Delivery point	Means a point of the power system, equipped with one or more meters where electricity is delivered into the grid

TERMS	DEFINITIONS
Direct Line	Either an electricity line linking an isolated production site with an isolated customer or an electricity line linking an electricity producer and an electricity supply undertaking to supply directly their own premises, subsidiaries and eligible customers
Dispatch Centre	A division of the OST which schedules and dispatches system resources to meet electric load requirements and to assure reliable system operations
Dispatchable Generating Unit	<p>A generating unit that may be scheduled in the wholesale electricity market, which may be:</p> <ul style="list-style-type: none"> - Electricity hydro generating units (HPPs) directly connected to the transmission network - Electricity thermal generating units (TPPs) directly connected to the transmission network - Independent electricity hydro generating units (HPPs) directly connected to the transmission network - Electricity generating units generating electricity for their own needs and directly connected to the transmission network that might import/export the electricity from/to the network
Dispatching	The operation of the power system in order to maintain balances of generation, import/export and electricity consumption in national level by providing the system security and safety
Dispute	It has meaning in these Market Rules and technical codes as any difference arising between the OST and any party under or in connection with the Market Rules and technical codes.
Distributed generation	Generation plants connected to the distribution system
Distribution	The transport of electricity on medium voltage and low voltage distribution systems with a view to its delivery to customers, but not including supply
Distribution Code	A set of technical rules, which govern the operation of distribution network, and establishes conditions and terms of service provided by the DSO to the customers
Distribution System Operator - DSO	A natural or legal person 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;

TERMS	DEFINITIONS
Dynamic Data Declaration	The physical characteristics of generators and certain large customers that inform the OST as to how output can change at the relevant generating unit or off-take unit
Economic precedence	The ranking of sources of electricity supply in accordance with economic criteria
Electricity	Means both, electric energy and electric power, unless the context requires otherwise
Electricity Market	Wholesale or retail commercial agreement to sale and purchase electricity in the power system in order to provide a reliable supply for the customers within the territory of the Republic of Albania
Electricity Regulatory Commission	the regulatory institution of electric power sector, which operates according to this Law
Eligible Customers	A customer that has the right to choose and sign a contract to purchase electricity from the licensed qualified supplier for the electricity he uses for his own needs
End-use Customer	A customer buying electricity for his own use
Energy efficiency/demand-side management	A global or integrated approach aimed at influencing the amount and timing of electricity consumption in order to reduce primary energy consumption and peak loads by giving precedence to investments in energy efficiency measures, or other measures, such as interruptible supply contracts, over investments to increase generation capacity, if the former are the most effective and economical option, taking into account the positive environmental impact of reduced energy consumption and the security of supply and distribution cost aspects related to it
ERE	Shall mean the Albanian Electricity Regulatory Authority, which legal basis for the exercise of their responsibilities is provided by the Law No. 9072, date 22.05.2003 "On the Power Sector", as amended
Final customers	Customers purchasing electricity for their own use

TERMS	DEFINITIONS
Force Majeure	An natural or social act or event occurred in the country as earthquakes, lightning, cyclones, floods, volcanic eruptions, fires or wars, armed conflict, insurrection, terrorist or military action, which prevent the licensee from performing its obligations under the license or other acts or events that are beyond the reasonable control and not arising out of the fault of the licensee, and the licensee has been unable to overcome such act or event by the exercise of due diligence and reasonable efforts, skill and care.
Generating Unit	A physical unit for the production of electricity
Generation	The production of electricity
Generation Account	An account registered with the OST by a generator or importing interconnection trading party for settlement purposes in which generator metered output and imported energy are recorded for each settlement period
Generation Company	A person licensed for carrying out the power generation activities
Generator Meter	A meter at a generating unit used for recording energy flow
Generator Meter Register	A register maintained by the OST in which each generating unit (except auto-producers and embedded generators) are registered in the Supply Meter Register
Generator	Legal person, holding a license for electricity generation
Grid Code	A set of technical rules, which governs the operation of transmission system
Horizontally integrated undertaking	An undertaking performing at least one of the functions of generation for sale, or transmission, or distribution, or supply of electricity, and another non electricity activity
Household customers	Customers purchasing electricity for their own household consumption, excluding commercial or professional activities

TERMS	DEFINITIONS
Imbalance	<p>The difference between the energy flow defined by a bilateral contract (i.e. the physical schedule nomination) and the actual metered energy flow, for a particular hour</p> <p>A generator is in balance when his metered generation equals his contracted delivery, in a particular hour.</p> <p>A supplier (external or eligible/eligible customer/DSO) is in balance when his metered off take matches his contracted off take</p> <p>A generator is short when his metered generation is less than his contracted delivery</p> <p>A supplier (external or eligible/eligible customer/DSO) is short when his metered off take is greater than his contracted off take</p> <p>A generator is long when his metered generation is greater than his contracted delivery</p> <p>A supplier (external or eligible/eligible customer/DSO) is long when his metered off take is less than his contracted off take</p>
Integrated electricity undertaking	A vertically or horizontally integrated undertaking
Interconnected systems	A number of transmission and distribution systems linked together by means of one or more interconnectors
Interconnection	A defined transmission line over which electricity can be traded with parties outside domain of the OST
Interconnectors	The equipment used to link electricity systems
IPP - Independent Power Producer	A producer generator connected to the transmission system. All Albanian producers other than the Public Generation Company are IPPs.
KESH	The National Electroenergetic Corporation
KESH Gen	Shall mean a division of KESH licensed for the production of electrical power. KESH Gen shall initially be the Public Generation Supplier.
License	An authorization granted to a person according to third part of the Power Sector Law
Licensee	a person that holds the license according to the third part of the Power Sector Law

TERMS	DEFINITIONS
Long-term planning	The planning of the need for investment in generation and transmission and distribution capacity on a long term basis, with a view to meeting the demand of the system for electricity and securing supplies to customers
Market Participation Agreement	The document signed by all parties who agree to be bound by the Market Rules
Market Rules	The rules regulating operation and management of the market, as well as commercial relations among license holders or parties that signed the Market Participation Agreement
Non-household customers	Any natural or legal persons purchasing electricity which is not for their own household use and shall include producers and wholesale customers
Off-take	It is related to electricity taken from transmission or distribution network
OST	Shall mean the electricity system operator with three functions: electricity market operator, transmission system operator and system dispatch operator
Participant	Means a legal person licensed or otherwise authorized by the ERE to participate in the Albania electricity market with the specified functions
Party	means a signatory to the Market Participation Agreement
Person	A physical or legal person
Physical Nomination	The notification made to the OST by a trading party specifying intended MW delivery or off-take over a specified day
Power Generation	The production of electric power through transformation of different energy resources by a Generation Company
Power Sector Law	Means the Law No. 9072, dated 22.05.2003 "On the power sector" as it may be amended from time to time
Power System	An interconnected system consisting of electric plants, power lines substations and distribution equipment, intended for transmission or distribution of electricity to the customers

TERMS	DEFINITIONS
Producer	A natural or legal person generating electricity
Public Generation Company	A person licensed by the ERE for carrying out the power generation activities. As long as this company has not been established, this function is performed by KESH Generation Division
Qualified Supplier	a person licensed to supply electricity directly to Eligible Customers
Renewable energy sources	The renewable non-fossil energy sources (wind, solar, geothermal, wave, tidal, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases)
Retail Public Supplier	Shall be the licensed provider of electricity supply for tariff customers. If the Retail Public Supplier license is held by a company that is affiliated with the company holding the license for Distribution, there shall be structural and financial separation of the supply and distribution functions.
Scheduled dispatch period	Means the shortest period for which the dispatch center performs and publishes a projected dispatch schedule based on projected electrical loads and actual offers and participant-directed schedule for resources
Security	Both security of supply and provision of electricity, and technical safety
SEE	the Electroenergetic System
Seller	Means any market participant that sell electricity to other market participants
Settlement period	A period of one hour starting on the hour over which energy delivery and contract delivery are measured
SPP - Small Power Plant	A generator connected to the distribution system of a capacity less than 5 MW
Standard parameters	The values of voltage and frequency level of supplied power to customers as defined by the regulations of power system operation approved by the ERE
Supply	The sale, including resale, of electricity to the customers
System users	Any natural or legal persons supplying to, or being supplied by, a transmission or distribution system

TERMS	DEFINITIONS
Tariff customer	The customer supplied by the Retail Public Supplier with regulated prices and tariffs
Tendering procedure	The procedure through which planned additional requirements and replacement capacity are covered by supplies from new or existing generating capacity
Third party access	The legal right of eligible customers and suppliers to use the transmission and distribution networks
Trader	The party that has signed the Market Participation Agreement in order to trade electricity
Transmission	The transport of electricity on the extra high-voltage and high-voltage interconnected system with a view to its delivery to final customers or to distributors, but not including supply
Transmission System	A system of lines, supporting structures, transforming and switching equipment used for the transmission of electricity
Transmission System Operator	A natural or legal person responsible for operating, ensuring the maintenance of and, if necessary, developing the transmission 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 transmission of electricity
UCTE	Means "Union for the Co-ordination of Transmission of Electricity", the European association co-coordinating the interest of European transmission system operators and guaranteeing the security of interchanges between grids
Wholesale customers	Any natural or legal persons who purchase electricity for the purpose of resale inside or outside the system where they are established
Wholesale Public Supplier	Shall mean the entity that purchases the electricity supply required by tariff customers and sells that supply to the Retail Public Supplier.