

NIGERIAN ELECTRICITY REGULATORY COMMISSION REGULATIONS FOR EMBEDDED GENERATION 2012

REGULATION NO: 0112

NIGERIAN ELECTRICITY REGULATORY COMMISSION

In exercise of its powers to make Regulations conferred by Section 96 (1) & (2) (c) & (d) of the Electric Power Sector Reform Act 2005 (Act No. 6 of 2005), the Nigerian Electricity Regulatory Commission makes the following Regulations for Embedded Generation 2012.

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CHAPTER I GENERAL PROVISIONS

1 Short Title

These regulations may be cited as the NERC Regulations for Embedded Generation 2012.

2. Commencement

These regulations shall come into force on the date on which they are approved by a resolution of the Commission, and signed by the Chairman who shall cause the seal of the Commission to be affixed thereto.

3. Interpretation

In these regulations, unless the context otherwise requires:

"Act" means the Electric Power Sector Reform Act 2005, as may be amended or reenacted from time to time.

Affiliate" means as defined in section 100(1) of the Act.

"Ancillary Services" means shall have the meaning assigned thereto in the Act.

"Business Day" means a day other than a Saturday, a Sunday or a day which is declared as a public holiday by the Federal Government of Nigeria, State and Local Governments.

"Business Rules" mean the Nigerian Electricity Regulatory Commission (Business Rules of the Commission) Regulations, 2006, and as amended;

"Capacity", in relation to a distribution system, means the capability of the network to convey electricity under a range of load and generation conditions in accordance with reasonable and prudent operating practice.

"Commission" means the Nigerian Electricity Regulatory Commission established under Part III of the Act.

"Connect", in relation to embedded generation, means to be connected to a distribution system or to a consumer installation that is connected to a distribution system.

"Connection and Operation Standards", in relation to a Distribution Licensee or Embedded Generation:

i. means requirements, as amended from time to time by the Distribution Licensee, that:

- A. are set out in written policies and standards of the Distribution Licensee; and
- B. relate to the connection of embedded generation and the operation of the distribution system, including requirements relating to the planning, design, construction, testing, inspection, and operation of assets that are, or are proposed to be, connected to the distribution network; and
- C. are made publicly available in accordance with the provision of these regulations; and
- D. reflect, or are consistent with, reasonable and prudent operating practice; and
- E. comply with the relevant provisions of the Technical Codes.
- ii. includes the following, as amended from time to time by the Distribution Licensee:
 - A. the Distribution Licensee's congestion management policy, as referred to in these regulations; and
 - B. the Distribution Licensee's emergency response policies; and
 - C. the Distribution Licensee's or Commission's safety standards

"Connection Offer" means a formal offer made by the Distribution Licensee to the Embedded Generator for connection to the distribution system.

"Connection Point" means an entry or an exit point on a distribution network

"Consumer Installation" includes:

- i. an electrical installation; and
- ii. any fittings that are used, or designed or intended for use, by any person in or in connection with the generation of electricity so that electricity can be injected into a distribution system

"Consumer" means as defined in Section 100(1) of the Act.

"Dedicated Connection Assets" means those assets installed for the purpose of connecting an embedded generation unit to the existing distribution system and which are expected to remain for the sole use of the embedded generation unit at all times over the lifetime of the installation.

"Disconnect" in respect of a connection, means to operate switching equipment so as to prevent the transfer of electricity through the connection

"Distribution" Code means the code and guidelines for the Nigerian electricity distribution system, for the time being or as may from time to time be approved by the Commission

"Distribution Licensee" means a holder of a distribution license granted under Part IV of the Act.

"Distribution System" means the system of facilities, as defined by the Commission, consisting wholly or mainly of low voltage of less than 132KV electric lines used for the distribution of electricity from grid supply points to the point of delivery to consumers or eligible customers, and includes any electrical plant and meters operated in connection with the distribution of electricity, but shall not include any part of a transmission.

"Eligible Customer" means a customer that is eligible, pursuant to a directive or directives issued by the Minister under section 27, to purchase power from a licensee other than a distribution licensee.

"Embedded Generation or EG" means the generation of electricity that is directly connected to and evacuated through a distribution system which is connected to a transmission network operated by a System Operations Licensee.

"Embedded Generator" means a person who operates an embedded generation unit.

"Extension Assets" means those assets installed to lengthen or otherwise extend the existing distribution system in order to facilitate the connection of an embedded generation unit and which are not for the sole use of the embedded generation unit.

"Feed-In-Tariff" means is a policy mechanism designed to accelerate investment in renewable energy technologies by offering incentives to renewable energy producers.

"**Grid Code**" means instructions, rules, procedures, guidelines, etc for the operation and planning of an interconnected power system and accounting requirements relating thereto.

"HV network" means the parts of the distribution system operating at a nominal voltage of 33 and 11 kV.

"Independent Electricity Distribution Network or IEDN" means a distribution system not directly connected to a transmission system operated by the System operations Licensee. "Isolated IEDN" means an independent electricity distribution networks in the urban or rural area that is not connected to an existing distribution network.

"Licence" means a licence issued by the Commission under Part IV of the Act.

"Licensee" means any person who holds a licence issued under Part IV of the Act.

"LV network" means the parts of the distribution system operating at a nominal voltage of 415 volts or less.

"Market Participant" means any person who is party to a Market Participation Agreement, including the Market Operator

"Market Rules" means Market Rules for Transitional and Medium Term Stages of the Nigerian Electrical Power Sector 2010 approved under section 26(2) of the Act.

"Metering Code" means the Nigeria Metering Code approved by the Commission for use in measuring the flow of energy within the transmission and distribution systems in the Nigerian electricity supply industry

"Non-Market Participant" means any person who is not a party to a Market Participation Agreement.

"Peak System Load" means the maximum energy that can be supplied within the distribution system.

"Reasonable and Prudent Operating Practice", in relation to embedded generation, includes operating within the stipulated industry operating standards; and taking measures to avoid the injection of electricity from embedded generation that:

- i. exceeds the capacity of the distribution system at the point of injection; or
- ii. results in excessive power flow at feeder points or a significant adverse effect on voltage levels; or
- iii. results in a significant adverse effect on the quality and reliability of supply to other users of the distribution system; and
- iv. the use or proposed use of reasonable and prudent measures to enable the connection of embedded generation

"Regulated Activities" means engaging in licensed activities such as generation, transmission, systems operation, distribution and trading.

"Renewable Energy Power Systems or REPS" means a power system that generates power using energy sources that replenishes such as solar energy, biomass, small hydro, and wind power etc.

"Standard Connection Agreement" means a connection agreement approved by the Commission, and published by the Distribution Licensee.

"Successor Distribution company" means a successor company that is granted a distribution license under s.67(1) of the Act

"System Operator" means the operator of one or more transmissions systems pursuant to a licence granted under section 66.

"System Operation Licence" means a licence granted under section 66.

"Technical Codes" means Grid Code, Distribution Code, Metering Code, Health & Safety Code and other codes approved by the Commission for the technical regulation of the electricity supply industry in Nigeria.

"Trading Licence" means a licence issued pursuant to section 67.

"Transmission" means the conveyance of electric power and energy over a transmission system.

b. Any term that is defined in the Act, and rules and codes of the Commission and used, but not defined, in these regulations has the same meaning.

c. Any term that is defined in the EPSR Act and used in these regulations, but not defined in these regulations or the rules, has the same meaning as in the Act.

4. Application of the Regulations

These Regulations apply to all embedded generators licensees, applications for embedded generation licences being processed by the Commission, and prospective embedded generators, unless otherwise specified.

5. Eligibility for procurement of Embedded Generation

Distribution Licensees intending to procure embedded generation shall first apply to the Commission for permission and shall satisfy sections 22.4.1 and 22.4.2 of the Market Rules prior to approval by the Commission.

CHAPTER II

DISTRIBUTION PLANNING

1. Planning for connection to the Distribution systems

- a. All Distribution Licensees shall be responsible for distribution planning including:
 - i. Forecasting the future demand on its distribution system;
 - ii. Analyzing the impact of the connection of new facilities such as generation unit(s), loads, distribution lines, or substations;
 - iii. Planning the expansion of the distribution system to ensure its adequacy to meet forecast demand and the connection of new facilities;
 - iv. Identifying and correcting problems on quality of supply, power quality and system losses in distribution system; and
 - v. Distribution Planning and System Studies.
- b. The Distribution licensee shall conduct an annual system plan which shall be approved by the Commission indicating the capacity requirements over a five (5) year period.
- c. The Distribution licensee shall assess the need for expansion of the distribution system and ensure that appropriate connections to the distribution systems are made.
- d. The Distribution licensee shall ensure that the embedded generator is appropriately informed with respect to the maximum capacity of the networks, most suitable location to ensure reliability and minimal loss factor and other critical factors such as load balance.

3. Distribution Systems Performance Analysis

- a. The Distribution licensee shall comply with service performance standards provided in part 2 of the Distribution Code.
- b. The Distribution licensee shall, in addition to the above, ensure that the availability of the distribution system is not less than 90%.

4. Metering

- a. The metering system of an Embedded Generator shall comply with the provisions of Part 3, Section 1.1.2 of the Distribution Metering Code (DMC) provided they are not participants in the market.
- b. If the Embedded Generator is a participant in the market, provisions of the Grid Metering Code in Part 2 of the Metering Code shall apply.

CHAPTER III CONNECTION OF EMBEDDED GENERATION

1. Classification of Embedded Generation

a. For the purposes of the application of these regulations the **EG units** size definitions shown in Table 1-1 shall apply.

Table 1-1

Technical Definition	Connection Voltage Level
Small Size Units having a nameplate rating greater than 1MW and not more than 6MW	11kV Medium Distribution Voltage
Large Size Units having a nameplate rating greater than 6MW and not more than 20MW	33kV Medium Distribution Voltage
Greater than 20MW	33kV Medium Distribution Voltage for every 20MW being evacuated

- b. Subsection (a)(i) notwithstanding, the Embedded Generator may evacuate power generated using the most appropriate and economical voltage level identified in the table above, based on tests conducted and paid for by the Embedded Generator.
- c. The maximum embedded generation capacity allowable for a given Distribution System shall be a percentage of the peak system load of the Distribution Licensee's distribution system which is determined by the Commission from time to time, except for an isolated IEDN.
- d. The Embedded Generating unit(s) above 5MW shall also comply with applicable provisions of the Grid Code except those connected to an isolated IEDN.
- e. Generating units with capacity of 20MW and above shall be centrally despatched by the System Operation Licensee, in accordance with the provision of the National Electric Power Policy (NEPP).

2. Access and Connection to the Distribution system

- a. The Distribution Licensee shall make access to the distribution systems available to the embedded generator in so far as there is capacity and after reaching an agreement with the generator on acceptable connection **c**onditions and fees.
- b. The **Distribution Licensee** shall publish its policies, procedures, technical requirements, commercial arrangements, connection procedures and the standard charges and agreements associated with the connection of an **EG unit** to its distribution system.

c. The **Distribution Licensee** shall negotiate in good faith, and shall offer fair and reasonable terms for the connection of an **EG unit** subject to, and in accordance with the provisions of these regulations and other relevant regulatory instruments.

3. Requirements for connection of Embedded Generation Units

- a. The general requirements for connection of an **EG unit** are as specified under Part 2 Section 4.14 of the Distribution Code, and any additional requirements which may be specifically applicable to the EG Unit, and as approved by the Commission.
- b. The **Distribution Licensee** shall discuss the general requirements, as set out in this Chapter, during any preliminary discussions with the prospective **EG** and provide details of the general requirements in writing as part of any **connection offer**.
- c. A **Distribution Licensee** shall be relieved of its obligation to connect an **EG unit** in the event that the Embedded Generator is unable or unwilling to fulfil the general requirements as set out in these regulations.
- d. In the event of being aware of a breach of these regulations, the Distribution Licensee shall notify the Embedded Generator and any other directly affected parties, of the breach and shall advise the EG of the Distribution Licensee's policy and procedures for handling disputes.
- e. The technical requirements at the connection point shall be as provided in Part 2, Section 4 of the Distribution Code.
- f. The Distribution Licensee shall comply with Appendix 4 of the Distribution Code, and the Health and Safety Code approved by the Commission.

4. Specific Requirements for Connection of Renewable Energy Power Systems (REPS)

In addition to the above listed requirements in subsection 3, operators of REPS shall ensure that where storage is not required, flexible generation shall exist to allow the intermittent and uncertain power to be absorbed into the network on a priority basis.

5. Availability of Information

- a. The Distribution Licensee shall make available to the public, free of charge, the following information to enable connection of embedded generation where consistent with connection and operation standards:
 - i. the guidelines for procurement of power;
 - ii. the Distribution Licensee's connection and operations standards;
 - iii. a copy of the standard terms and conditions of all agreements;
 - a statement of the policies, rules, or conditions under which embedded generation is, or may be, curtailed or interrupted from time to time in order to ensure that the Distribution Licensee's other connection and operations standards are met; and
 - v. the relevant connection fees approved by the Commission.

b. The information listed above shall be available on the website of the Distribution Licensee, and shall also be forwarded to the Commission on a quarterly basis, and whenever there is any amendment by the Licensee.

6. Right to Open Access

The Distribution Licensee shall provide non-discriminatory open access to its distribution system for use by the Embedded Generator and any other licensees, or prospective generator or licensee.

7. Procurement Process

The procurement of power shall be competitive and in accordance with the provisions of the Bulk Generation Procurement Guidelines and Codes approved by the Commission.

8. Connection Agreement

The Distribution Company shall develop and publish a standard connection agreement for Embedded Generation, setting out the commercial and technical responsibilities of the parties.

9. Connection Charges

The Distribution Licensee shall not, except as approved by the Commission, impose charges for the receipt, processing and/or consideration of responses to RFPs, or for the issue of the connection offer or connection agreement.

10. Confidentiality of information provided

Information provided to the Distribution Licensee pursuant to the RFP shall be kept confidential by the Distribution Licensee except as agreed otherwise by the applicant, and the obligation to keep information confidential includes:

- a. an obligation not to use the information for any purpose other than enabling the connection of the particular embedded generation; and
- b. an obligation to destroy the information as soon as is reasonably practicable after the later of when the information is no longer required, or five (5) years after receiving the information.

11. Annual reporting

The Distribution Licensee shall supply a report to the Commission on or before January 30 of each year stating, in relation to the preceding calendar year:

- a. the number of response to the RFPs received;
- b. the numbers of responses approved and those declined;
- c. the number of connections completed in that preceding year, including the date of the response, the date of connection, and the rated capacity of the generation connected; and

d. the number of connections of embedded generation disconnected in that preceding year, including the date of the disconnection, and the rated capacity of the generation disconnected.

12. Record keeping

A Distribution Licensee shall maintain, for 5 years, records of all responses to RFPs received and the resulting outcomes, provided that such records shall include details of how long it took to procure and connect or decline a response and justification for these outcomes.

CHAPTER IV COMMISSIONING PROCEDURE

1. Testing and inspection

- a. The Embedded Generator shall test and inspect the EG Unit(s) in accordance with the provisions of part 2 section 3 subsection 3.4 of the Distribution Code.
- b. The Embedded Generator shall give adequate notice of the date for testing and inspection to the Distribution Licensee, who may send representatives or agents to the site to observe the testing and inspection.
- c. The Embedded Generator shall provide the Distribution Licensee with a written test report after completion of the testing and inspection, including satisfactory evidence that the metering installation complies with provisions of the Metering Code.

2. Information Required Prior to Commissioning

The Embedded Generator shall provide information listed in Part 2 section 3 subsection 3.3.5 of the Distribution Code, prior to the commissioning of the EG Unit.

CHAPTER V COMMERCIAL ARRANGEMENTS

1. Network Agreements

- a. The Embedded Generator and the Distribution Licensee shall enter into the various Network Agreements such as, but not limited to, Power Purchase Agreement, Connection Agreement/interface Agreement, Use of Networks Agreement, and Ancillary Services Agreement
- b. The Distribution Licensee shall develop and publish a template of the above listed agreements, with the standard terms and conditions approved by the Commission.
- c. The distribution licensee and the Embedded Generator may in their power purchase agreement, determine the charges, and any relevant security for such charges, that shall

be paid by the distribution licensee to the Embedded Generator for such capacity and energy that is made available to the distribution licence.

2. Network Charges

- a. The Distribution Licensee shall be entitled to impose reasonable charges for connection to the distribution system, which shall be approved by the Commission prior to implementation.
- b. The Distribution Licensee shall provide in the connection offer a disaggregation of the proposed charges which shall indicate the cost of the following:
 - i. dedicated connection assets required for the connection;
 - ii. extension of the existing asset;
 - iii. modification and augmentation of the existing network;
 - iv. metering and data collection; and
 - v. any provision for operation, repair and maintenance of relevant network assets.
- d. At the request of an Embedded Generator, the Distribution Licensee shall provide further disaggregation of the proposed connection charges including the design, construction and project management elements of the cost category items.
- e. The charges may be modified by the Distribution Licensee based on a request for an increase in access to a shared network capacity by a connected Embedded Generator.
- f. The cost of an extension and or augmentation of a network being shared by more than one Embedded Generator and applicant shall be borne by all the beneficiaries.

3. Tariff for Eligible Customers

- Pursuant to the provisions of the Act and subject to the declaration of eligible customers by the Minister of Power, the EG may enter into agreements with eligible customers. The end-User Customer tariff shall be negotiated between the parties.
- b. The EG shall also agree with the Distribution Licensee on the use of its networks, and the Distribution Use of System (DUoS) Charge shall be guided by the provisions of the tariff methodology approved by the Commission, and in force at the time of agreement.

4. Tariffs for Distribution and Trading Licensees

The tariff methodology in force as approved by the Commission, shall apply to agreements for purchase of power with Distribution and Trading Licensees, subject to the conditions specified in Section 22, sub-sections 22.4.1-2(a) & (b) of the Market Rules.

5. Recovery of Cost by Embedded Generator

Where the Distribution Licensee cannot undertake the re-enforcements and extension needed to evacuate the power generated into the network, the Connection Agreement shall provide

for the recovery of the cost incurred by the Embedded Generator for any re-enforcements or extension executed, and be based on an agreed timeline.

6. Feed-In-Tariffs (FITs)

Feed-In-Tariffs (FITs) approved by the Commission, shall be applied for energy produced by Renewable Energy Embedded Generators, and shall be fixed for a specified period, subject to periodic reviews and approval by the Commission.

CHAPTER VI TECHNICAL AND NON-TECHNICAL LOSSES

1. Reduction of Losses

- a. Cost of distribution losses shall be borne by the party responsible for such losses.
- b. All losses shall be calculated on a consistent basis by the parties at the interface boundaries
- c. Each EG Units' metered generation and customer consumption should be scaled by a distribution loss factor (DLF).
- d. Distribution losses are assigned to market participants using DLFs which are determined by the System Operator using methodology that is agreeable to all participants.
- e. The Distribution Licensee shall embark on loss mitigation strategies to optimize revenue.
- f. Metering of Customers and Embedded Generators shall be mandatory.
- g. Billing shall be consolidated in the master database system of the Distribution Licensee for proper energy accounting irrespective of metering technology.
- h. Mitigation methods for reducing technical losses shall include, but not limited to, proper siting of EG Units, deployment of High Voltage Distribution Systems (HVDS), reconductoring of undersized lines, use of low loss transformers and proper balancing of loads between line phases.

CHAPTER VII APPLICATION FOR A LICENCE

1. General Provisions

- a. All applications and related proceedings before the Commission for grant of an embedded generation licence shall be governed by provisions the NERC Application for Licences Regulations 2010 or as amended and the NERC Licence and Operating Fees Regulations 2010 or as amended.
- b. The period between the acknowledgement of receipt of a complete application, and the date on which the Commission notifies the applicant of its decision to approve or refuse the issuance of a licence shall not exceed six (6) months.

c. The application for licence shall be accompanied by the documents listed in Schedule I.

2. Mandatory Condition for Grant of Licence

The Commission shall not issue a licence to an Embedded Generation Facility unless it is satisfied that Sections 22.4.1 and 22.4.2 of the Market Rules have been complied with.

CHAPTER VIII ENGAGING IN OTHER REGULATED ACTIVITIES

1. Prohibition to Engage in Other Regulated Activities

- a. An EG licensee shall not engage in the business of distribution, transmission, trading, and system operations.
- b. Notwithstanding the above provision, an affiliate of the EG may be licensed to engage in these other regulated activities provided the Commission is satisfied that the applicant will not abuse market power to the detriment of consumers or that appropriate safeguards exist to prevent such abuse.
- c. The EG licensee and its licensed affiliate shall prepare and keep separate accounts for each of the licensed activities.
- d. A Distribution Licensee may engage in Embedded Generation by incorporating a separate legal entity, and subsequently applying for a licence to be an Embedded Generator.
- e. The Embedded Generator and its affiliate shall comply with the Affiliate Code of Conduct approved by the Commission.

2. Connection to Transmission Network

- a. The Embedded Generator may connect to the transmission network whenever the need arises.
- b. An Embedded Generator intending to connect to the transmission network shall apply for an amendment of the Terms and Conditions of its Embedded Generation licence.
- c. Whenever such condition arises, modifications to the connection facilities shall be made to enable the connection to the transmission networks and such other conditions as interface issues, protection schemes and any other requirements as specified in the Grid Code.
- d. Where the Embedded Generator will fund the required re-enforcement(s), modifications and extension(s) on the transmission network in order to evacuate the power generated into the network, the Connection Agreement shall provide the terms for the recovery of the cost to be incurred by the Embedded Generator, and be based on an agreed timeline.

CHAPTER IX MISCELLANOUS PROVISIONS

1. Proceedings before the Commission

All proceedings before the Commission under these regulations shall be governed by the Business Rules of the Commission, and as amended thereof.

2. Amendment or repeal

The Commission may amend or repeal, in whole or in part, the provisions of these Regulations.

3. Dispute resolution

Disputes between the Distribution Licensee and Embedded Generator which are not resolved by the parties will be handled in accordance with the Dispute Resolution procedure in Rule 43 of the Market Rules, or the Dispute Resolution procedure approved by the Commission, as applicable.

SIGNED BY THE ORDER OF THE COMMISSION

__, 2012 ar day of On this Dr. Sam Amadi Chairman/CEO

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SCHEDULE I

LIST OF MANDATORY REQUIREMENTS

The following documents shall be submitted by the applicant embedded generator:

- i. Executed Power Purchase Agreement
- ii. Executed Connection Agreement
- iii. Executed Use of Distribution System Agreement
- iv. Executed Ancillary Services Agreement
- v. Executed Fuel Supply Agreement
- vi. Environmental Impact Assessment Approval if capacity is 10MW and above, or Policy for managing effluents and discharges if capacity is below 10MW
- vii. Registered Title deed
- viii. Corporate Documents (Certificate of Incorporation, Memorandum and Articles of Association, etc)