



DEPARTMENT CIRCULAR NO. DC 2019-08-0012 *A*

**PROVIDING A FRAMEWORK FOR ENERGY STORAGE SYSTEM IN THE  
ELECTRIC POWER INDUSTRY**

**WHEREAS**, Republic Act No. 7638 or the "*Department of Energy Act of 1992*" established, among others, the power and function of the Department of Energy (DOE) to establish and administer programs for the exploration, transportation, marketing, distribution, utilization, conservation, stockpiling, and storage of energy resources of all forms, whether conventional or non-conventional;

**WHEREAS**, Section 37 of Republic Act No. 9136, otherwise known as "*Electric Power Industry Reform Act of 2001*" or the EPIRA, provides that the DOE shall undertake, among others, the formulation of policies for the planning and implementation of a comprehensive program for the efficient supply and economical use of energy consistent with the approved national economic plan and with the policies on environmental protection and conservation and maintenance of ecological balance, and provide a mechanism for the integration, rationalization, and coordination of the various energy programs of the Government and ensure the reliability, quality and security of supply of electric power;

**WHEREAS**, the EPIRA, following the restructuring of the electricity sector, further mandates the DOE to: (i) facilitate and encourage reforms in the structure and operations of Distribution Utilities for greater efficiency and lower costs; and (ii) develop policies and procedures and, as appropriate, promote a system of energy development incentives to enable and encourage electric power industry participants to provide adequate capacity to meet demand including, among others, reserve requirements;

**WHEREAS**, in other jurisdictions, Energy Storage System (ESS) technologies are applied to serve a variety of functions in the generation, transmission and distribution of electric energy, among which are Energy Generation, Peak Shaving and Ancillary Services (AS);

**WHEREAS**, the increasing penetration of Variable Renewable Energy (VRE) necessitates the recognition of ESS as one of the technologies to manage intermittent operations of the VRE-generating plants' output thereby ensuring system stability;

**WHEREAS**, ESS will be one of the key elements in the proposed Smart Grid Roadmap which the DOE is promulgating to guide the Electric Power Industry in the implementation of respective initiatives to modernize the power system;

**WHEREAS**, to ensure optimal utilization of ESS in the Philippines, the DOE conducted a review of all relevant policies and guidelines and existing practices in other jurisdictions, and subjected to Focus Group Discussions (FGDs) its concept paper containing its recommendations in various dates as follows: 21 and 23 March 2018 and 23 April 2018;

**WHEREAS**, the DOE, in consideration of the inputs gathered during the FGDs, formulated a draft circular providing for policies on ESS which was subjected to public consultations in Luzon (18 September 2018), Visayas (24 August 2018) and Mindanao (31 August 2018);

**NOW, THEREFORE**, for and in consideration of the foregoing premises, the DOE hereby issues, adopts and promulgates this Circular governing ESS:

**SECTION 1. General Policies and Principles.** The DOE recognizes the applications and the benefits of ESS as an emerging technology in the improvement of the electric power system in accordance to the objective of ensuring the quality, reliability, security and affordability of the supply of electric power. Hence, to maximize these benefits, ESS shall operate within the framework of:

- 1.1. Generation Companies whose facilities supply electricity to the Grid or the distribution system;
- 1.2. Provision of Central Dispatch by the System Operator to Grid-connected and embedded ESS with material impact to Grid in the interest of achieving economic operation and maintenance of quality, stability, reliability and security of the transmission system;
- 1.3. Compliance to the EPIRA and its IRR, Philippine Grid Code (PGC), Philippine Distribution Code (PDC), Wholesale Electricity Spot Market (WESM) Rules and its Market Manuals, Philippine Electrical Code and other pertinent issuances by the DOE, Energy Regulatory Commission (ERC) and other relevant government instrumentalities having authority over the Grid's reliability and supply security; and
- 1.4. Market share and bilateral contracts limitation under Section 45 of the EPIRA and other relevant regulations issued by the ERC concerning abuse of market power and competition.

**SECTION 2. Definition of Terms.** The terms as used in this Circular shall have the following meaning:

- 2.1. ***"Ancillary Services" or "AS"*** refer to support services such as Primary Reserve, Secondary Reserve, Tertiary Reserve, Reactive Power Support and Black Start Capability which are necessary to support the transmission capacity and energy that are essential in maintaining Power Quality and the reliability of the Grid;

- 2.2. **"Directly Connected Customers" or "DCC"** refer to industrial or bulk electricity End-Users, which are supplied through the Grid or Sub-transmission Assets that are still owned by the National Transmission Corporation;
- 2.3. **"Distributed Energy Resources" or "DER"** refer to smaller power sources that could be aggregated to provide power necessary to meet regular demand. These may also refer to demand and supply-side resources that can be deployed throughout the system of a network service provider to meet the energy and reliability needs of the customers served by the system, including but not limited to, renewable energy facilities, managed loads (including electric vehicle charging), energy storage, and other measures necessary to incorporate renewable generation resources, including load management and ancillary services, such as reserves, voltage control and reactive power and black start capabilities;
- 2.4. **"Electric Power Industry Participant"** refers to any person or entity engaged in the generation, transmission, distribution or supply of electricity;
- 2.5. **"Embedded Generator" or "EG"** refers to generating units that are indirectly connected to the Grid through the distribution system that supplies power to its host DU or the Grid;
- 2.6. **"End-User"** refers to any person or entity requiring the supply and delivery of electricity for its own use;
- 2.7. **"Energy Storage System" or "ESS"** refers to a facility acting as a load and a generator, which is designed to receive, store and convert such energy to electricity;

ESS technologies shall include:

- 2.7.1. **"Battery Energy Storage System" or "BESS"** – capable of storing electric energy electrochemically from which it is able to charge or discharge electric energy;
- 2.7.2. **"Compressed Air Energy Storage" or "CAES"** – uses electric energy to inject high-pressure air containers. When electricity is required, the pressurized air is heated and expanded in an expansion turbine driving a generator for power production;
- 2.7.3. **"Flywheel Energy Storage" or "FES"** – uses electric energy to accelerate a rotating mass, called a "rotor", to store kinetic energy. Electricity is extracted from the system by drawing down the kinetic energy from the rotor; and
- 2.7.4. **"Pumped-Storage Hydropower" or "PSH"** – uses electric energy to pump water from a lower elevation reservoir to a higher elevation reservoir. When required, the water flows back from the upper to the lower reservoir, powering a turbine with a generator to produce electric energy.

Pursuant to this Circular, the DOE may identify, adopt and recognize any other ESS technologies that may be developed in the future.

- 2.8. **"Electric Power Industry Reform Act of 2001" or "EPIRA"** refers to Republic Act No. 9136;
- 2.9. **"Grid"** refers to the high voltage backbone system of interconnected transmission lines, substations and related facilities, located in each of Luzon, Visayas and Mindanao, or as may be determined by the ERC in accordance with Section 45 of the EPIRA;
- 2.10. **"Hybrid Power Systems"** refer to a combination of two (2) or more different technologies to produce power;
- 2.11. **"Market Operator" or "MO"** refers to the entity responsible for the operation of the WESM in accordance with the WESM Rules;
- 2.12. **"Micro-grid system"** refers to a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid;
- 2.13. **"Power Quality"** refers to the quality of the voltage, including its frequency and resulting current, that are measured in the Grid, distribution system, or any user system during normal conditions;
- 2.14. **"Qualified Third Party" or "QTP"** refers to the alternative electric service provider authorized to serve remote and unviable areas pursuant to Section 59 of the EPIRA and Rule 14 of the EPIRA-IRR;
- 2.15. **"Small Grid"** refers to the backbone system of interconnected High Voltage lines or Medium Voltage lines, substations and other related facilities not connected to the National Grid in Luzon, Visayas and Mindanao;
- 2.16. **"Small Grid Owner" or "SGO"** refers to the party that owns the backbone Transmission or Sub-transmission or Distribution System, and is responsible for planning, operations and maintaining adequate capacity;
- 2.17. **"System Operator" or "SO"** refers to the entity responsible for generation dispatch, or the implementation of the generation dispatch schedule of the MO, the procurement of AS, and operation to ensure safety, power quality, stability, reliability and security of the Grid;
- 2.18. **"System Operator-Small Grid" or "SO-Small Grid"** refers to the party responsible for generation dispatch, or the implementation of the generation Dispatch Schedule, the provision of ancillary services, and operation to ensure safety, power quality, stability, reliability and security of the Small Grid;

- 2.19. *“Transmission Network Provider” or “TNP”* refers to the party that is responsible for maintaining adequate Grid capacity in accordance with the provisions of the Philippine Grid Code.

**SECTION 3. Scope.** This Circular shall apply to the following Electric Power Industry Participants:

- 3.1. Generation Companies (GenCos) owning and/or operating ESS which include, but is not limited to, the following technologies:
- 3.1.1. Battery Energy Storage System;
  - 3.1.2. Compressed Air Energy Storage;
  - 3.1.3. Flywheel Energy Storage;
  - 3.1.4. Pumped-Storage Hydropower; and
  - 3.1.5. Other emerging technologies that may be identified, qualified, and approved by DOE as ESS.
- 3.2. Distribution Utilities (DUs);
- 3.3. Directly Connected Customers (DCCs) owning and operating ESS;
- 3.4. End-Users owning and operating ESS;
- 3.5. Qualified Third Parties (QTPs);
- 3.6. Transmission Network Provider (TNP);
- 3.7. System Operator (SO); and
- 3.8. Market Operator (MO).

**SECTION 4. Duties and Responsibilities.** ESS proponents shall have the following responsibilities:

**4.1. Generations Companies**

- 4.1.1. May own and operate an ESS as a stand-alone generating facility or integrate ESS in its existing generating facilities; and
- 4.1.2. Register the ESS separately in the WESM, either as a stand-alone generating facility or integrate ESS in its existing generating facility.

**4.2. Distribution Utilities**

- 4.2.1. Develop or enhance appropriate internal business procedures for the connection of ESS to its distribution network, consistent with the PGC, PDC and other applicable regulations and guidelines;

- 4.2.2. Ensure that the operation of ESS connected to its distribution network is pursuant to the standards set forth in the PGC, PDC and other applicable guidelines;
  - 4.2.3. Coordinate with the SO with regard to connection or disconnection of ESS that are mandated to register in the WESM;
  - 4.2.4. Report to the MO any ESS within its franchise area that are mandated to register in the WESM;
  - 4.2.5. Ensure the transparent and fair imposition of Distribution Wheeling Service charges, in accordance with the applicable ERC guidelines;
  - 4.2.6. Notify the TNP upon receipt of the connection application of an ESS with sizes of 10MW and above for Luzon, or 5MW and above for Visayas and Mindanao; and
  - 4.2.7. Include in its Monthly Operation Report (MOR), and other appropriate reportorial requirements, the operation of DU-owned and operated ESS.
- 4.3. **Directly Connected Customers**
- 4.3.1. May own and operate an ESS for the purpose of managing their energy demands, subject to permitting requirements such as electrical permit from the local government unit, and Certificate of Compliance (COC) from the ERC, as may be applicable;
  - 4.3.2. Provide the following information to TNP, SO and MO as part of the data/documentary requirements:
    - 4.3.2.1. Type of ESS;
    - 4.3.2.2. Capacity and rate of charge and discharge;
    - 4.3.2.3. Proposed application/purpose/operation (including supply-demand scenarios); and
    - 4.3.2.4. Other information as may be required by the TNP, SO and MO.
  - 4.3.3. Include in its MOR the operation of ESS as an AS Provider.
- 4.4. **End-users**
- 4.4.1. May own and operate ESS for the purpose of managing their energy demands, subject to permitting requirements such as electrical permit from the local government unit, and operating requirements of the DU, as may be applicable; and
  - 4.4.2. Provide the following information to the DU as part of the data/documentary requirements:

- 4.4.2.1. Type of ESS;
- 4.4.2.2. Capacity and rate of charge and discharge;
- 4.4.2.3. Proposed application/purpose/operation; and
- 4.4.2.4. Other information as may be required by the DU.

#### **4.5. Qualified Third Party**

May own and operate ESS in conjunction with RE-based generating facilities or as part of hybrid power system to provide continuous electric service to households in the form of either a micro-grid or a DER, in consonance with the total electrification program of the government.

#### **4.6. Transmission Network Provider and Small Grid Owner**

- 4.6.1. Shall not own and operate an ESS;
- 4.6.2. For TNP to incorporate in the annual Transmission Development Plan, the recommended sizing and siting of ESS, taking into consideration existing transmission capacity and planned upgrading; and
- 4.6.3. For both TNP and SGOs to consider ESS as an alternative solution to address the transmission congestion and transmission facilities upgrade deferment.

#### **4.7. System Operator and System Operator-Small Grid**

- 4.7.1. Shall not own and operate an ESS;
- 4.7.2. Within ninety (90) days upon effectivity of this Circular, shall develop, in coordination with stakeholders, the following:
  - 4.7.2.1. Testing standard and procedure for ESS; and
  - 4.7.2.2. Accreditation process on the approval of ESS.

Such accreditation and testing standard and procedure shall be submitted as part of the Ancillary Services Procurement Plan to the ERC for approval and furnish copy to the DOE;

- 4.7.3. Optimize the addition of ESS for AS application and ensure proper allocation for each type of AS consistent with the Grid requirement;
- 4.7.4. Formulate allocations for each type of ESS for AS application with preference to environment-friendly and indigenous sources of energy;
- 4.7.5. Include in its Daily Operation Report the operation of ESS as an AS Provider; and
- 4.7.6. In coordination with the MO and the host DUs, as to ESS connected to its distribution system, recommend changes to the Dispatch

Protocol Manual and other relevant Market Manuals for the approval of the DOE, to allow the provision of AS by the ESS. For the SO-small grid, their responsibility shall be limited to the formulation of the dispatch protocol manual.

#### **4.8. Market Operator**

- 4.8.1. Submit to the Rules Change Committee proposed changes to the WESM Rules and Market Manuals in accordance with the policy provided herein, as necessary;
- 4.8.2. Ensure registration of all ESS mandated to register in the WESM;
- 4.8.3. Submit regular reports to the DOE with respect to the status of registration of ESS in the WESM and their impact to market operations; and
- 4.8.4. As may be necessary, recommend policies to address issues relating to market operations brought by ESS adoption and operations.

**SECTION 5. Purposes of ESS.** ESS proponents shall apply and register their ESS for one or more of the following purposes:

#### **5.1. Provision of Ancillary Services**

ESS, on its own or as integrated in a generating plant, shall be used to support the transmission capacity and energy that are essential in maintaining Power Quality and the reliability of the Grid. AS provider, providing frequency regulation function, shall be sized at least 20 MW for the Luzon Grid and at least 5 MW for Visayas and Mindanao grids in compliance with the observed frequency response characteristic recognized by the PGC.

#### **5.2. Provision of Energy through Bilateral Supply Contracts or Trading in the WESM**

Generation Companies may utilize ESS for selling power through Bilateral or Retail Supply Contracts, or Trading Energy in the WESM.

#### **5.3. Manage the Penetration of Renewable Energy**

Generation Companies may integrate ESS in its VRE facilities for the purpose of mitigating its intermittent generation output and support the Grid in maintaining Power Quality and reliability. The installation of ESS to a Feed-in Tariff (FIT)-eligible VRE should not in any way increase the VRE plant's capacity and generation entitled to FIT. The ESS may only be charged through the VRE facilities' output.



#### **5.4. Auxiliary Load Management for Generation Companies**

ESS when embedded/integrated in the power system of a Generation Company can be used to supply to auxiliary loads during hours of high demand enabling higher energy dispatch.

#### **5.5. Transmission/Distribution Facility Upgrades Deferral**

ESS when connected to appropriate nodes may defer the need for additional transmission/distribution facility upgrades by supplying the peak demand of grid/end-users through ESS.

#### **5.6. Transmission Congestion Relief**

ESS when connected to appropriate nodes can mitigate or eliminate the congestion when demand for power exceeds the transmission network capability that may lead to violation of thermal or voltage stability.

#### **5.7. End-User Demand Management**

ESS can be used to manage end-user energy requirements.

#### **5.8. Distribution Utility Demand Management**

Involves the process of storing energy available during off-peak periods, and discharging the stored energy in the power system during peak periods thereby reducing consumption from the Grid.

#### **5.9. Distribution Utility Power Quality Management**

Involves the process of using ESS to improve the Power Quality of a distribution system.

The abovementioned purposes shall be updated by the DOE, when it may deem necessary.

**SECTION 6. Permitting and Licensing Requirements.** The following shall govern the licensing requirements of ESS:

- 6.1.** All ESS proponents shall secure a COC as a Generation Company from the ERC pursuant to existing guidelines on licensing of generation facilities;
- 6.2.** DUs owning and entering into Power Supply Agreements with ESS proponents for the supply of electricity to its captive customers shall observe, among others, the following guidelines:
  - 6.2.1.** Market share and bilateral contract limitations under Section 45 of the EPIRA; and

6.2.2. Competitive Selection Process Policy pursuant to the DOE Department Circular No.DC2018-02-0003 and other related issuances.

- 6.3. All ESS shall comply with the rules and regulations on Safety, Health, Environmental Standards and Proper Disposal enforced by appropriate government agencies; and
- 6.4. All ESS proponents shall secure an Environmental Compliance Certificate or any other equivalent document from the Department of Environmental and Natural Resources (DENR) and other requirements by relevant government agencies pursuant to their existing guidelines.

**SECTION 7. Connection and Operational Requirements.** The following shall govern the connection and operational requirements of ESS:

- 7.1. All ESS connected to the Transmission System shall comply with the connection and operational requirements for Generation Companies pursuant to the PGC, WESM Rules and relevant Market Manuals, and other relevant policies and regulations promulgated by the ERC and DOE;
- 7.2. All ESS connected to the Distribution System shall comply with the connection and operational requirements, for Embedded Generation Companies, of the PDC and other relevant policies and regulations promulgated by the ERC and DOE;
- 7.3. All ESS connected to the Distribution System and mandated to register in the WESM shall comply with the connection and operational requirements for Embedded Generation Companies pursuant to the PDC, PGC, WESM Rules and relevant Market Manuals and other relevant policies and regulations promulgated by the ERC and DOE;
- 7.4. All ESS connected or intending to connect to Micro-Grid Systems shall comply with connection and operational requirements as provided by applicable guidelines of the ERC; and
- 7.5. All ESS connected or intending to connect to Off-Grid Areas shall comply with DOE Department Circular No. DC2019-01-0001.

**SECTION 8. Market Registration and Participation.** The following shall govern the registration and participation of ESS in the WESM:

- 8.1. The following ESS shall register in the WESM and, thereafter, be subjected to central dispatch by the SO:
  - 8.1.1. ESS connected to the Transmission System;
  - 8.1.2. ESS connected to the Distribution System with a capacity equal to or above the following regional thresholds:

- 8.1.2.1. 10 MW for Luzon Grid;
- 8.1.2.2. 5 MW for Visayas Grid; and
- 8.1.2.3. 5 MW for Mindanao Grid.

ESS connected to the Distribution System, which has a capacity less than the above threshold may register in the WESM on a voluntary basis;

- 8.2. ESS mandated to register in the WESM shall be classified under the Generation Company category, in accordance with the WESM Rules and Market Manuals;
- 8.3. All ESS integrated in Generating Facilities of Generation Company shall be required to have separate registration in the WESM and shall comply with the requirements on separate metering and monitoring facilities, among others; and
- 8.4. The DOE, in coordination with the MO and SO, shall annually review the criteria for mandatory registration, and recommend revision as may be necessary.

**SECTION 9. Regulatory Support.** The ERC is hereby directed to assist DOE in the implementation of this Circular, specifically:

- 9.1. To issue appropriate and applicable cost recovery mechanism and pricing structure, including power delivery charges, in consideration of reduction in the investment attributed to deferred generation, transmission and distribution capacities and establishment of the appropriate and applicable testing and accreditation of standards and procedures for the deployment of ESS;
- 9.2. To ensure the inclusion of ESS-related rules, procedures, requirements, and standards in the Open Access Transmission Service Rules, Distribution Service Open Access Rules, AS Procurement Plan, PGC, PDC, and Philippine Small Grid Guidelines; and
- 9.3. To facilitate the entry and participation of Third Party/Parties in the accreditation and testing standard and procedure for ESS as AS Providers.

**SECTION 10. Standards and Safety Codes.** Recognizing the necessity to ensure successful and safe deployment of ESS, the Professional Regulatory Commission, DENR, Department of Labor and Employment, the Department of Trade and Industry-Bureau of Product Standards, other relevant government agencies and concerned stakeholders shall be sought to develop or improve standards and safety codes for ESS technologies or options/scenarios available for ESS installation, and occupational safety and health standards.

**SECTION 11. Proper Disposal and Recycling of ESS.** ESS proponents are mandated to recycle and properly dispose ESS facilities and components in compliance with the DENR Administrative Order no. 2013-22 or other related issuances pursuant to the R.A. No. 6969, otherwise known as the "Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990".

**SECTION 12. Repealing Clause.** Nothing in this Circular shall be construed as to amend, supersede, or repeal any of the mechanism or institutions already existing or responsibilities already allocated and provided for under any existing law, rule, or contract.

**SECTION 13. Separability Clause.** If any section or provision of this Circular is declared unconstitutional or invalid, the other parts or provisions hereof which are not affected thereby shall continue to be in full force and effect.

**SECTION 14. Effectivity.** This Circular shall take effect immediately after its publication in two (2) newspapers of general circulation, and copies of this Circular shall be filed with the University of the Philippines Law Center-Office of the National Administrative Register.

Signed this \_\_\_\_\_ day of \_\_\_\_\_ 2019 at DOE, Energy Center, Rizal Drive, Bonifacio Global City, Taguig City, Metro Manila.

  
ALFONSO G. CUSI  
Secretary



AUG 01 2019