



DEPARTMENT CIRCULAR NO. DC2019- _____ - _____

**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 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 the Republic Act No. 9136, otherwise known as the “Electric Power Industry Reform Act of 2001” or “EPIRA”, mandates the Department of Energy (DOE), to supervise the restructuring of the electricity industry, and 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, Section 37 of the Republic Act No. 9136, following the restructuring of the electricity sector, the DOE shall, among others:

- (i) Facilitate and encourage reforms in the structure and operations of distribution utilities for greater efficiency and lower costs;
- (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; and
- (iii) Monitor private sector activities relative to energy projects in order to attain the goals of the restructuring, privatization, and modernization of the electric power sector as provided for under existing laws: *Provided*, That the Department shall endeavor to provide for an environment conducive to free and active private sector participation and investment in all energy activities;

WHEREAS, Section 3 of Rule 5 of the Implementing Rules and Regulations (IRR) of the EPIRA provides that the National Transmission Corporation or its Buyer or Concessionaire or any of its stockholders or officials or any of their relatives within

the fourth civil degree of consanguinity or affinity, legitimate or common law, shall not hold any interest, whether directly or indirectly, in any Generation Company or Distribution Utility;

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, there are existing and prospective ESS proponents in the country who raised concerns on the lack of governing policy framework for its regulation and operation;

WHEREAS, the Visayas Grid continues to experience load dropping due to the intermittency of the operations of Variable Renewable Energy (VRE) generating plants in the area, which resulted to the recognition of ESS as a technology to manage intermittent operations of the VRE-generating plants' output thereby ensuring system stability;

WHEREAS, it is recognized that some forms of ESS contain chemicals that are potentially harmful for both human lives and the environment. The recycling and proper disposal of ESS facilities and components shall be under the responsibility of the ESS proponent;

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, the DOE, cognizant of the need to address any policy gaps and ensure optimal utilization of ESS in the Philippines, conducted review of all relevant policies and guidelines and existing practices in other jurisdictions and presented to Focus Group Discussions (FGDs) its concept paper containing its recommendations in various dates as follows: 21 and 23 March 2018 at F1 Hotel Manila (Bonifacio Global City) in Taguig City and 23 April 2018 at The Legend Villas in Mandaluyong City;

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 on various dates as follows: 24 and 31 August 2018 at Crown Regency Hotel in Cebu City and The Royal Mandaya Hotel in Davao City, respectively, and 18 September 2018 at The Legend Villas in Mandaluyong City;

NOW, THEREFORE, pursuant to its authority and mandate under the EPIRA and its IRR, and after due consideration of the foregoing premises and the inputs from various stakeholders, the DOE hereby issues, adopts and promulgates the following:

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 Company whose facilities are capable of supplying electricity;
- 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 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 their respective meanings as follows:

- 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 directly supplied with electricity by a Generation Company or Power Sector Assets and Management Corporation (PSALM) or NPC through Sub-transmission Assets;
- 2.3. **“Distributed Energy Resources” or “DER”** refer to smaller power sources that could be aggregated to provide power necessary to meet regular demand;
- 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 into underground geologic cavities or aboveground 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.

The DOE may identify, adopt and recognize pursuant to this Circular, any 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 any power or energy generation facility which makes use of two (2) or more types of technologies utilizing both conventional and/or renewable fuel sources;
- 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. A micro-grid can connect and disconnect from the grid to enable it to operate in both grid-connected or island mode;

- 2.13. **“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.
- 2.14. **“System Operator” or “SO”** refers to the entity responsible for generation dispatch, or the implementation of the generation dispatch schedule of the MO, the provision of AS, and operation to ensure safety, power quality, stability, reliability and security of the Grid.
- 2.15. **“Time-of-Use rate” or “TOU”** refers to a pricing mechanism designed to reflect the cost of electricity at any particular time of the day.

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 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. Customers and End-Users owning and/or operating ESS which include:
 - 3.2.1. Distribution Utilities (DU); and
 - 3.2.2. Directly Connected Customers (DCCs).
- 3.3. Qualified Third Party (QTP);
- 3.4. Transmission Network Provider (TNP);
- 3.5. System Operator (SO);
- 3.6. Market Operator (MO); and
- 3.7. Philippine Electricity Market Corporation (PEMC).

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 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 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 and assist the same in registering in the WESM;
- 4.2.5.** Ensure the transparent and fair imposition of Distribution Wheeling Service charges, in accordance with the applicable guidelines issued by the ERC;
- 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) the operation of ESS located within its franchise area.

4.3. Directly Connected Customers

- 4.3.1.** May own and operate an ESS for its own use, 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 COC from the ERC, 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

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

4.6. System Operator

- 4.6.1.** Shall not own and operate an ESS;
- 4.6.2.** Within ninety (90) days upon effectivity of this Circular, shall develop the following:
 - 4.6.2.1.** Testing standard and procedure for ESS; and
 - 4.6.2.2.** Accreditation process on the approval of ESS as AS Provider.

Such accreditation and testing standard and procedure shall be submitted to the ERC for approval and furnish copy to the DOE;

- 4.6.3.** Incorporate in the annual Transmission Development Plan, the recommended sizing and siting of ESS, taking into consideration existing transmission capacity and planned upgrading;
- 4.6.4.** Consider ESS as an alternative solution to address the transmission congestion and transmission facilities upgrade deferment;
- 4.6.5.** Include in its Daily Operation Report the operation of ESS as an AS Provider; and
- 4.6.6.** In coordination with the MO and the host DUs, as to ESS connected to the 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.

4.7. Market Operator

- 4.7.1. Submit to the Rules Change Committee proposed changes to the WESM Rules and Market Manuals in accordance with the policy provided herein, as necessary;
- 4.7.2. Ensure registration of all ESS mandated to register in the WESM;
- 4.7.3. 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
- 4.7.4. As may be necessary, recommend policies to address issues relating to market operations brought by ESS adoption and operations.

4.8. Philippine Electricity Market Corporation

- 4.8.1. As the governing body for WESM, shall monitor compliances with the market rules by the market participants owning, operating and/or using ESS.

SECTION 5. Purposes of ESS. ESS proponents shall apply and register their ESS for 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.

5.2 Manage the Penetration of Renewable Energy

VRE GenCos may integrate ESS in its facilities for the sole purpose of mitigating its intermittent generation output. The installation of ESS to a Feed-in Tariff (FIT)-eligible VRE should not in any way increase the VREs capacity and generation entitled to FIT. The ESS may only be charged through the VRE facilities' output.

5.3 Transmission/Distribution Facilities Upgrade Deferment

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

5.4 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.

5.5 End-User Demand Management

5.5.1. ESS, in conjunction with net-metering facilities, can be used to supply end-user energy requirements and/or provide back-up during power interruptions.

5.5.2. It may also involve the use of energy stored in the ESS when retail TOU prices are high and charge the ESS when prices are low.

5.6 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.

5.7 Micro-Grid Formation

Involves the deployment of ESS in conjunction with local generation to supply a load or several loads connected or with no connection to the grid.

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

SECTION 6. Permitting and Licensing Requirements. The following shall govern 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 All ESS shall comply with the rules and regulations on Safety, Health, Environmental Standards and Proper Disposal enforced by appropriate government agencies;

6.3 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; and

6.4 DUs owning and entering into Power Supply Agreements with ESS proponents shall observe, among others, the following guidelines:

6.4.1 Market share and bilateral contract limitations under Section 45 of the EPIRA; and

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

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; and
- 7.4. All ESS connected or intending to connect to Isolated Distribution Systems shall comply with connection and operational requirements as provided by applicable guidelines of the ERC.

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 Pmax 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 Pmax 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 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 review the criteria for mandatory registration annually and may recommend revision thereof, as necessary.

SECTION 9. Regulatory Support. The ERC shall have the following responsibilities:

- 9.1 In the exercise of its powers and functions under the EPIRA, shall support the enforcement of this Circular through the issuance of 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 Ensure that the basic rules, procedures, requirement, and standards that will govern the operations of ESS shall be included in the Open Access Transmission Service Rules, Distribution Service Open Access Rules, AS Procurement Plan, PGC, PDC, and Philippine Small Grid Guidelines;
- 9.3 Develop appropriate rules and regulations to recognize other ESS technologies and applications consistent with the definition provided in this Circular; and
- 9.4 Facilitate the entry and participation of Third Party/Parties for the accreditation and testing standard and procedure of potential AS Providers to hasten the participation of ESS as AS Provider.

SECTION 10. Standards and Safety Codes. Recognizing the necessity to ensure successful and safe deployment of ESS, the Professional Regulatory Commission, DENR and the Department of Trade and Industry-Bureau of Product Standards and other relevant government agencies are requested to develop standard and safety codes for ESS technologies or options/scenarios available for ESS installation.

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 Republic Act No. 6969, otherwise known as the “Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990”.

ESS proponents may consider the following options:

- 11.1. Return the ESS facilities and components to the original supplier/manufacturer; or
- 11.2. Send the ESS facilities and components to any recognized entity which has substantial knowledge, capital and investment for its proper disposal or recycling.

DOE shall be copy furnished on any issuances of ESS proponent on their reports of recycling and disposal to be submitted to DENR.

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