Republic of the Philippines
DEPARTMENT OF ENERGY
(Kagawaran ng Enerhiya)

DEPARTMENT CIRCULAR NO. DC2018- -

ADOPTION OF ENERGY STORAGE SYSTEM IN THE ELECTRIC POWER INDUSTRY

WHEREAS, Republic Act No. 7638 or the "Department of Energy Act of 1992" established the power and function of the DOE to, among others, 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), in addition to its powers and functions under Republic Act No. 7638 to supervise the restructuring of the electricity industry, and shall undertake, among others, to formulate 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 environment 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, in the Philippines, the Kalayaan Pumped Storage Power Plant is considered as an Energy Storage System (ESS) as it uses electric energy to store energy at night, wherein the demand is low, and then pumps water from Laguna Lake to Caliraya reservoir generating energy during daytime peak period;

WHEREAS, another form of existing ESS in the Philippines is the 10 MW Masinloc Battery Energy Storage, which intends to provide Ancillary Service;

WHEREAS, in other jurisdictions, 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 service;

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, the Department of Energy is promulgating the Smart Grid Roadmap aimed to guide electric industry participants in the implementation of respective initiatives to modernize the power system and that ESS will be one of the key elements in developing a Smart Grid.

NOW THEREFORE, for and in consideration of the foregoing premises, the DOE hereby recognizes the applicability of ESS in the operations of the electric power industry.

SECTION 1. General Policies and Principles. Pursuant to the Policy of the State to ensure the quality, reliability, security and affordability of the supply of electric power, this ESS policy is hereby adopted to:

1.1. Recognize ESS and its corresponding applications and benefits to the electric power industry; and

1.2. Encourage the use of ESS for the operational improvement of electric power industry.

SECTION 2. ESS Definition and Technologies.

2.1. **Definition**. For purposes of this policy, an ESS is a facility:

2.1.1. which is connected to the grid, small grid, distribution system and end-user facility; and

2.1.2. which is designed to receive electrical energy, to store energy, and

2.1.2.1. to convert such energy to electricity and deliver such electricity for energy demand and requirement, or

2.1.2.2. to convert such energy to provide improved reliability or economic benefits to the electric power industry.

2.2. **Technologies**. ESS technologies are, but not limited to, the following:

2.2.1. Battery Energy Storage System (BESS) – capable of storing electric energy electrochemically from which it is able to charge or discharge electric energy;

2.2.2. Compressed Air Energy Storage (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;

2.2.3. Flywheel Energy Storage (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

2.2.4. Pumped-Storage Hydropower (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.

SECTION 3. Applications of ESS by Electric Power Industry Participants. ESS provides several applications depending on the capability of the type of technology. The applications of certain types of ESS is indicated in Annex A on this Department Circular.

SECTION 4. Scope and Responsibilities. This Circular shall apply to any entity that plans, owns, operates an ESS facilities, such as but not limited to:

4.1 Distribution Utilities (DUs)

4.1.1 DUs may consider owning and operating an ESS.

4.1.2 DUs' ownership of an ESS shall conform to the cross ownership provision in the EPIRA and its Implementing Rules and Regulations.

4.1.3 DUs planning to own and operate an ESS shall indicate such plans in the Distribution Development Plan. DUs shall indicate the following minimum requirements:

4.1.3.1 Type of ESS;
4.1.3.2 Capacity and rate of charge and discharge; and
4.1.3.3 Proposed application / use / operation (including supply demand scenarios)

4.1.4 DUs shall duly inform the System Operator on any modification of the distribution system resulting from the connection or use of an ESS.

4.1.5 DUs intending to procure an ESS or source supply from generation companies who offer electricity supply from an ESS shall go through the process of Competitive Selection Process.

4.1.6 ESS connected to the Distribution System, with a size of at least 10 MW for Luzon, and 5 MW for Visayas and Mindanao, shall comply with the WESM Rules and Manuals.

4.2 Generations Companies (GenCos)

4.2.1 Existing and prospective GenCos may introduce ESS as a means of provision of ancillary service, subject to the accreditation process and testing standard and procedure of the System Operator.

4.2.2 Existing and prospective GenCos may introduce ESS as a means of provision of electric power supply.

4.2.3 Existing and prospective GenCos may integrate ESS in its generating facilities.

4.2.4 Existing and prospective GenCos planning of integrating an ESS to a generating facility other than an ESS, and charging it directly through the same facility, shall be exempted from registration to the WESM.

4.2.5 Existing and prospective VRE GenCos may integrate ESS in its facilities for the sole purpose of mitigating its intermittent generation output.

4.2.5.1 ESS integrated to VRE generating facilities, for purposes of ensuring stability of supply, shall not result to the increase of the VRE generating plant's power curve.

4.2.5.2 ESS integrated to VRE generating facilities shall be contingent with SO verification.

4.3 Qualified Third Party (QTP)

QTPs supplying unviable areas, waived by DUs, shall consider owning and operating ESS to ensure continuity of electricity service in these areas, in conjunction with other generation plants.

4.4 System Operator (SO)

4.4.1 Within ninety (90) days upon effectivity of this Circular, the SO, shall develop an accreditation process and a testing standard and procedure, for the approval of ESS as Ancillary Service Provider. Such accreditation and testing standard and procedure shall be submitted to the Energy Regulatory Commission for approval, copy furnished the DOE.

4.4.2 The SO, for purposes of ensuring optimal use of ESS as Ancillary Service Provider, shall determine the siting and sizing of the ESS. Such information shall be included in the annual Transmission Development Plan for the reference of prospective AS Providers.

4.5 Market Operator (MO)

The MO shall develop and/or amend the Wholesale Electricity Spot Market (WESM) Rules, Manuals and Procedures to consider ESS in the operations and trading in the WESM, for the approval of the DOE.

4.6 Directly Connected Customers (DCCs) and End-Users (EUs);

4.6.1 DCCs and EUs may own and operate an ESS for its own use only, wherein the end-user can configure and optimize their supply needs.

4.6.2 EUs connected to DUs who are planning to own and operate an ESS, shall duly inform the DU.

4.6.3 EUs connected to DUs, planning of owning an ESS, shall provide the DU with the following information:

4.6.3.1 Type of ESS;
4.6.3.2 Capacity and rate of charge and discharge; and
4.6.3.3 Proposed application / use / operation (including supply demand scenarios)

4.6.4 DCCs who plans to own an ESS, shall duly inform the SO and MO, and shall comply with existing rules and regulations for owning a generating unit.

SECTION 5. Regulatory Support.

5.1. The Energy Regulatory Commission (ERC), 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.

5.2. The ERC shall ensure that the Philippine Grid Code, Philippine Distribution Code, rules, procedures, requirement, and standards would identify the operations of ESS.

5.3. The ERC shall develop appropriate rules and regulations on the capacity of supply from ESS that may be utilized by DUs.

5.4. The ERC shall develop appropriate rules and regulations to recognize other ESS technologies and applications consistent with the definition provided in Section 2.1. of this Circular.

SECTION 6. Obligation to Rule 5 of the EPIRA-IRR. ESS as a generator shall comply with the provisions of Rule 5 of the EPIRA-IRR for the Generation Sector.

SECTION 7. Standards and Safety Codes. Recognizing the necessity to ensure successful and safe deployment of energy storage systems in the electric power industry, appropriate government agencies are enjoined to develop standard and safety codes for ESS technologies or options/scenarios available for ESS installation.

SECTION 8. 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 9. Separability Clause. If for any reason, 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 10. Effectivity. This Department 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 _____ 2018 at DOE, Energy Center, Rizal Drive, Bonifacio Global City, Taguig City, Metro Manila.

ALFONSO G. CUSI
Secretary

POSSIBLE APPLICATIONS OF ENERGY STORAGE SYSTEM

Application	Industry Sector	Description	BESS	CAES	FES	PSH
Intermittent Renewable Energy Smoothing and Shaping	Generation	Optimize the operation of VRE generating facilities which shall mitigate its intermittent output	✓		✓	✓
Ancillary Service Provision	Transmission	ESS is considered well suited for Ancillary Services which are necessary to support the transmission capacity and Energy that are essential in maintaining Power Quality and the Reliability of the Grid	✓	✓	✓	✓
Ancillary Service Provision: Black Start Provision	Generation	Unit sits fully charged, discharging when black start capability is required	✓	✓		✓
Transmission Infrastructure	Transmission	ESS that is connected to appropriate nodes may defer the need for additional transmission upgrades by supplying the peak demand of grid customer with ESS	✓			
Distribution Infrastructure	Distribution	ESS that is connected to appropriate nodes may defer the need for additional distribution upgrades by supplying the peak demand end-users with ESS	✓			
Peak Shaving	Transmission / Distribution	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.	✓	✓	✓	✓
Transmission Congestion Relief	Transmission	ESS that is connected to appropriate nodes can mitigate or eliminate the congestion when demand for power transmission exceeds the transmission network capability that may lead to a violation of thermal or voltage stability or angular stability	✓	✓	✓	✓
End-User Time-of-Use (TOU) Rate Optimization	Customer	Charge device when retail TOU prices are low and discharge when prices are high	✓	✓		✓

Application	Industry Sector	Description	BESS	CAES	FES	PSH
Load Side Supply	Customer / End-User	Enable greater use of RE system installed and ultimately may match demand and energy requirement.	✓			
Uninterruptible Power Supply	Customer / End-User	End user deploys energy storage to improve power quality and /or provide back-up power during outages	✓		✓	
Distributed Energy Resource/ Micro-Grid Formation	Generation / Distribution	Energy storage systems is deployed in conjunction with local generation to separate from the grid, creating an islanded micro-grid	✓			

✓– Possible use for application