



Republic of the Philippines
DEPARTMENT OF ENERGY

DEPARTMENT CIRCULAR NO. DC2020-02-0003 *μ*

**PROVIDING A NATIONAL SMART GRID POLICY FRAMEWORK FOR THE
PHILIPPINE ELECTRIC POWER INDUSTRY AND ROADMAP FOR DISTRIBUTION
UTILITIES**

WHEREAS, Section 2 of Republic Act No. 9136, otherwise known as the Electric Power Industry Reform Act of 2001 (EPIRA), provides that it is a declared policy of the State, among others, to:

"xxx xxx

- b) Ensure the quality, reliability, security and affordability of the supply of electric power;*

xxx xxx

- f) Protect the public interest as it is affected by the rates and services of electric utilities and other providers of electric power;*

- g) Assure socially and environmentally compatible energy sources and infrastructure; and*

xxx xxx

- k) Encourage the efficient use of energy and other modalities of demand side management.*

WHEREAS, Section 37 of the EPIRA mandates the Department of Energy (DOE) to supervise the restructuring of the electric power industry and undertake, among others, the following:

- a) 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 of 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;*

xxx xxx

- c) Prepare and update annually a Power Development Program (PDP) and integrate the same into the Philippine Energy Plan (PEP). The PDP integrate*

the individual or joint development plans of the generation, transmission, and distribution sectors of the electric power industry;

- d) Ensure the reliability, quality and security of supply of electric power; and*
- e) Facilitate and encourage reforms in the structure and operations of distribution utilities (DUs) for greater efficiency and lower costs;*

xxx xxx

WHEREAS, a Smart Grid (SG) uses innovative technologies to modernize the electric grid infrastructure to effectively address 21st century challenges of consumer empowerment, energy supply flexibility and security, electric grid performance and asset utilization, and environmental protection;

WHEREAS, on 11 March 2013, the DOE promulgated Department Circular (DC) No. DC2013-03-0003, entitled, *"Creating an Inter-Agency Steering Committee for the Development and Formulation of a Comprehensive and Holistic Smart Grid Policy Framework and Roadmap for the Philippine Electric Power Industry"*, which directed the DOE as the lead agency, along with the National Power Corporation (NPC), National Transmission Corporation (TRANSCO), Philippine Electricity Market Corporation (PEMC), National Grid Corporation of the Philippines (NGCP) and National Electrification Administration (NEA), to achieve the following deliverables:

- (a) Proposal for a Smart Grid National Strategy for the period until 2030 with major consideration on the possible impact to the price of electricity;
- (b) Formulation and preparation of the transition policies and guidelines for the effective implementation of Smart Grid by all electric power industry participants;
- (c) Preparation of a Roadmap for Smart Grid implementation; and
- (d) Formulation of customer education and information framework for country wide Smart Grid awareness and acceptance.

WHEREAS, the DOE envisions, as indicated in PEP 2040 and PDP 2040 to support national economic development goal towards Ambisyon Natin 2040, to transform the whole Philippine power sector into a secure, stable, flexible, sustainable, digitally enabled, and interoperable system that provides reliable, efficient, and quality energy through grid modernization and consumer empowerment;

WHEREAS, in order to support and implement the mandates of the Inter-Agency Steering Committee, the DOE issued Special Order (SO) No. SO2018-10-0057, dated 17 April 2018, entitled, *"Creating the Department of Energy Smart Grid Technical Working Groups (DOE SG-TWGs)"*, focusing on six (6) key areas, namely:

- a) *Power Systems Operations led by Electric Power Industry Management Bureau (EPIMB);*
- b) *Sustainable and Renewable Energy led by Renewable Energy Management Bureau (REMB);*
- c) *Standardization led by Energy Utilization and Management Bureau (EUMB);*
- d) *Information and Communication Technology and Cybersecurity led by the Information Technology and Management Services (ITMS);*
- e) *Regulatory Support led by the Legal Services (LS); and*
- f) *Consumer Empowerment led by the Consumer Welfare and Promotion Office (CWPO);*

WHEREAS, the DUs have adopted and implemented various levels of Smart Grid initiatives in their operations considering, among others, the following:

- a) *A need to upgrade the electricity grid in ensuring its reliability and resiliency;*
- b) *Higher customer demand and expectations;*
- c) *Increasing penetration of Variable Renewable Energy (VRE) Sources and growing deployment of Electric Vehicles (EVs);*
- d) *Improvement of energy and power system efficiency and flexibility; and*
- e) *To achieve full implementation of Retail Competition and Open Access (RCOA), Renewable Portfolio Standards (RPS), Green Energy Option (GEOP), and Net Metering;*

WHEREAS, on 19 April 2019, Republic Act (RA) No. 11285 or the *Energy Efficiency and Conservation Act (EECA)* was signed to implement the energy efficiency and conservation plans and programs of the DOE on a national level;

WHEREAS, RA No. 11234 or the *Energy Virtual One-Stop Shop (EVOSS) Act* and its implementing rules and regulations, under Department Circular No. DC2019-05-0007, sets the timeframe for government agencies to decide on applications and cases relative to energy generation, transmission and distribution projects;

WHEREAS, the DOE deems it necessary to develop a Smart Grid Policy and Roadmap to achieve the goals of the EPIRA and to meet the 21st century challenges of the Electric Power Industry;

WHEREAS, in consideration of the inputs gathered during the Focus Group Discussions (FGDs), the DOE formulated a draft circular providing policies and roadmap on Smart Grid which was subjected to public consultations in Luzon (16 July 2019), Visayas (11 July 2019), and Mindanao (3 and 9 July 2019);

NOW, THEREFORE, for and in consideration of the aforementioned premises, the DOE hereby issues the following policies and roadmap for the development and implementation of Smart Grid in the country.

SECTION 1. Guiding Principles. Pursuant to the Policy of the State to supervise the restructuring of the electric power industry and to ensure the quality, reliability, security and affordability of supply of electric power, the DOE adopts the following criteria for the transition of the Philippine Power System into a Smart Grid by 2040:

1.1. Safety

Improve overall system protection to prevent direct or indirect harmful and dangerous effects to consumers from any electrical risks;

1.2. Reliability

Improve grid reliability to ensure the delivery of electric power to satisfy the consumer demand, and enhance the capability of the Power System to respond to disturbances without any adverse effects to the same, while maintaining optimal operation of the grid;

1.3. Efficiency

Reduce the technical and non-technical power and energy losses, in order to ensure energy-saving benefits for the Generation, Transmission and Distribution sectors;

1.4. Flexibility / Sustainability

Enhance the ability of the power system to respond to changes in demand and supply, and allow the smooth integration of emerging technologies to the grid;

1.5. Resiliency

Improve the ability of the grid, exposed to hazards, to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner, through the preservation and restoration of its essential basic structures and functions; and

1.6. Consumer Empowerment

Improve consumer awareness and engagement through monitoring and managing energy consumption and promote new emerging technologies such as electric vehicles, net metering, smart monitoring equipment and appliances, among others.

SECTION 2. Definition of Terms. The terms as used in this Circular shall have their respective meanings as follows:

- 2.1. **Advanced Distribution Management System or ADMS** – refers to a platform that integrates hardware and multiple utility-based systems which provides automated outage restoration and optimization of distribution grid performance;
- 2.2. **Advanced Metering Infrastructure or AMI** – refers to an integrated system of smart meters, communications networks, and implementation systems that enables two-way communication between utilities and its customers. Customer systems may include in-home displays, home area networks, energy management systems, and other customer-side-of-the-meter equipment that enable smart grid functions in residential, commercial, and industrial facilities;
- 2.3. **Automatic Meter Reading or AMR** – refers to the technology of automatically collecting consumption, diagnostic, and status data from energy metering devices and transferring that data to a central database for billing, troubleshooting, and analysis;
- 2.4. **Building Energy Management System or BEMS / Home Energy Management System or HEMS** – refers to a computer-based control system installed in houses or buildings that controls and monitors mechanical and electrical equipment such as air-conditioning and ventilation, lighting, water heaters, pumps, other power consuming equipment, fire protection and security systems, among others. Dwellings or Buildings with HEMS/BEMS installed in its premises are generally considered as Smart Homes / Buildings;
- 2.5. **Conventional Meter** – refers to an electronic or mechanical energy-measuring device without any communication capability;
- 2.6. **Cybersecurity** – refers to a collection of tools, policies, security concepts, security safeguards, guidelines, risk management approaches, actions, training, best practices, assurance and technologies that can be used to protect the cyber environment, the organization and user's assets;
- 2.7. **Demand Response or DR** – refers to a mechanism in which the utility can, for a just cause, curtail the load at customer premises or disconnect certain equipment of the customer remotely from the utility's control center. Customer participation for DR program may be sought through incentives and penalties;
- 2.8. **Demand Response Management System or DRMS** – refers to a software platform that allows a utility to manage all aspects of their DR programs through a single, integrated system;
- 2.9. **Demand-Side Management or DSM** – refers to plans, programs, and technologies that encourage consumers to optimize their energy use;
- 2.10. **Distributed Energy Resources or DER** – refers to smaller power sources that could be aggregated to provide power necessary to meet regular demand;

- 2.11. **Distribution Management System or DMS** – refers to a collection of software applications designed to monitor and control the entire distribution network efficiently and reliably;
- 2.12. **Distribution Automation or DA** – refers to an integrated system that enables an electric utility to automate and remotely monitor, control and coordinate all the distribution components installed in their franchise area;
- 2.13. **Energy Management System or EMS** – refers to a set of computer-aided tools that is capable of monitoring, controlling, and optimizing the operation of geographically dispersed generation and transmission assets in real-time;
- 2.14. **Electric Power Industry Reform Act of 2001 or EPIRA** – refers to Republic Act No. 9136;
- 2.15. **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;
- 2.16. **Fault Location, Isolation and Service Restoration or FLISR** – refers to various technologies and systems which work in tandem to locate a fault, reduce both the impact and length of power interruptions by isolating the affected area/s, and automate power restoration;
- 2.17. **Flexible Generation** – refers to a power generating facility with fast ramping / fast start-up and shutdown capabilities connected directly to the transmission or distribution system that helps manage fluctuations in supply and addresses the intermittency of increasing variable renewable energy power plants;
- 2.18. **Geographic Information System or GIS** – refers to a collection of computer hardware, software and geographic data for capturing, managing, analyzing and displaying every form of geographically referenced information, often called spatial data.
- 2.19. **Grid** – refers to the high voltage backbone system of interconnected transmission lines, substations and related facilities, located in Luzon, Visayas and Mindanao or as may be determined by the Energy Regulatory Commission (ERC) in accordance with Section 45 of the EPIRA;
- 2.20. **Interoperability** – refers to an open architecture system with the ability of information systems and smart grid technologies to work together within and across organizational boundaries;
- 2.21. **Islanding** – refers to a condition in which a power system, consisting of DU/s, power source/s and load/s, continues to operate whenever the power from the grid is no longer present;

- 2.22. Micro-grid System** – refers to a group of interconnected loads and DERs 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 which enables it to operate either in grid-connected mode or in island mode;
- 2.23. Mobile Workforce Management System or MWMS** – refers to a system platform that enables a utility to allot maintenance jobs to the crews in the field on real-time basis. Information on the type of fault is made available on the Mobile to support troubleshooting. Good mobile workforce management applications will have real-time scheduling engine integrated to the GIS;
- 2.24. Outage Management System or OMS** – refers to a utility network management software application that models network topology for safe and efficient field operations related to outage restoration. OMSs tightly integrate with call centers to provide timely, accurate, customer-specific outage information, as well as with the supervisory control and data acquisition (SCADA) systems for real-time confirmed switching and breaker operations. These systems track, group, and display outages to safely and efficiently manage service restoration activities;
- 2.25. Peak Load Management** – refers to plans, programs, and technologies that allow distribution utilities to manage its customer demand during peak hours;
- 2.26. Smart Distribution / Substation Automation or SDA / SSA** – refers to various automated control techniques that optimize the performance of power distribution networks by allowing individual devices to sense the operating conditions of the grid around them and make adjustments to improve the overall power flow and optimize performance;
- 2.27. Smart Grid** – refers to a modernized electrical grid that utilizes innovative technologies with two-way and/or multi-way communication technologies, real-time monitoring and control systems to:
- 2.27.1.** Improve overall reliability, power quality, security, efficiency and management of the electricity grid with full cybersecurity and interoperability;
 - 2.27.2.** Allow suitable integration of bulk and flexible generation, distributed energy resources, micro-grids, and electric vehicles with management systems; and
 - 2.27.3.** Empower customers with the provision of timely information and control options through enhanced energy management systems.
- 2.28. Smart Appliances / Devices** – refers to real-time, automated, interactive technologies that optimize the physical operation of appliances, communication technologies, and consumer devices;

- 2.29. **Smart Meter** – refers to an electronic real-time energy-measuring device that is capable of remote connect/disconnect switching, outage and tamper detection, and has a two-way communication between the meter and the utility. A smart meter records consumption of electric energy in intervals of an hour or less and communicates that information back to the utility for monitoring and billing;
- 2.30. **Supervisory Control and Data Acquisition or SCADA** – refers to a system of software and hardware components that allows the utility to:
- 2.30.1. Control processes locally or at remote locations;
 - 2.30.2. Monitor, gather, and process real-time data;
 - 2.30.3. Directly interact with equipment through human-machine interface software; and
 - 2.30.4. Record events into a log file.
- 2.31. **Substation Automation or SA** – refers to an integrated system that enables an electric utility to automate and remotely monitor, control and coordinate the distribution components installed in the substation;
- 2.32. **Virtual Power Plant or VPP** – refers to a network of aggregated decentralized, medium-scale power generating units such as, but not limited to, Combined Heat and Power (CHP) units, wind farms, solar PVs, flexible power consumers/prosumers and energy storage systems. The interconnected units will be dispatched through the central control room of the VPP. These VPPs aim to relieve the load on the grid by intuitively distributing the aggregated power generated by the individual units; and
- 2.33. **Wide Area Monitoring System or WAMS** – refers to a system to improve situational awareness and visibility within the grid. With Phasor Measurement Units (PMU) that are capable of fast and accurate measurements, the grid records synchro-phasor data that is accurately time-stamped.

SECTION 3. Scope and Coverage. This Circular shall apply primarily to Distribution Utilities (DUs), including grid-connected, micro-grids and off-grid systems. This shall be supported by and linked to the following Electric Power Industry Participants:

- 3.1. Generation Companies (GenCos);
- 3.2. Transmission Network Provider (TNP);
- 3.3. Customers / End-users which include:
 - 3.3.1. Utility Customers, and
 - 3.3.2. Non-Utility Customers;

- 3.4. System Operator (SO);
- 3.5. Market Operator (MO); and
- 3.6. Market Governance.

SECTION 4. Smart Grid Vision. Towards this end, it is envisioned that the Philippines will reach a level of Smart Grid development capable of the following:

- 4.1. Self-healing grid;
- 4.2. Full Customer Choice;
- 4.3. Full Implementation of the Retail Competition and Open Access (RCOA), Renewable Portfolio Standards (RPS), Green Energy Option (GEOP), and Net Metering;
- 4.4. Optimized Energy Storage Systems (ESSs), Energy Management Systems (EMSs), and Distributed Energy Resources (DERs) Management Systems;
- 4.5. Virtual Power Plant Integration;
- 4.6. Islanding;
- 4.7. Demand Response, Demand-Side and Peak Load Management; and
- 4.8. Smart Homes and Cities.

SECTION 5. Overall Framework and Infrastructure. The framework and infrastructure of the SG shall be comprised of the following major sectors:

- 5.1. **Smart Power Generation.** The Smart Power Generation (SPG) shall be envisioned as a secure, fast, dynamic, flexible, and efficient resource capacity by integrating new and emerging technologies into the Generation Sector. This includes, among others, the use of DERs, Hybrid Systems, ESSs, and Flexible Generation.

SPGs shall gradually be integrated into the wholesale and retail electricity markets for the provision of energy and ancillary services. The integration of SPGs is envisioned to improve the competition in the electricity market and the efficiency, reliability and flexibility of power grid operations.

The use of advance monitoring systems in power generation facilities is predicted to contribute in reducing power plant outages and in improving plant maintenance scheduling. Enhancements in forecasting and generation planning are also expected as modern software capable of handling multiple parameters emerge.

- 5.2. Transmission Modernization.** A modernized transmission grid shall have, among others, the following features:

- 5.2.1. Wide Area Monitoring and Control;
- 5.2.2. Regional Frequency and Voltage Stability Control;
- 5.2.3. Full Transmission Automation; and
- 5.2.4. Island-to-Grid interconnection.

The integration of SG in the transmission system is envisioned to improve system efficiency and to minimize losses in the transfer of electricity from one node to another. This development will allow adequate response to grid disturbances and will address grid resiliency.

- 5.3. Smart Distribution Utility.** A Smart Distribution Utility (SDU) shall be envisioned to be a reliable, flexible, resilient and secure automated distribution system integrated with decentralized energy sources. This modernized distribution system is expected to promote consumer empowerment and to influence consumer behavior towards efficient utilization of energy.

To realize this vision, the DUs shall be guided by the Smart Distribution Utility Roadmap (SDUR) attached herein as **Annex A**.

- 5.3.1. Levelling as to Networks.** SDUR levelling as to Networks is categorized, as follows:

- Level 0 –** refers to DUs that have yet to initiate any SG plans and programs and are considered as manually-operated system;
- Level 1 –** refers to DUs that have initiated the installation and integration of reclosers, sectionalizers, load break switches, fault circuit indicators, SCADA system/s, and/or GIS;
- Level 2 –** refers to DUs that have initiated the installation of remote voltage regulators and/or capacitor banks and/or the implementation of DA, SA, DMS, OMS, and/or MWMS;
- Level 3 –** refers to DUs that have initiated the implementation of FLISR and/or ADMS with SDA and SSA; and
- Level 4 –** refers to DUs that have fully implemented SDA and SSA.

- 5.3.2. Levelling as to Customer Service.** SDUR levelling as to Customer Service is categorized as follows:

- Level 0 –** refers to DUs using conventional metering and have yet to initiate any AMI plans and programs;

- Level 1 –** refers to DUs that have initiated the installation and integration of AMR;
- Level 2 –** refers to DUs that have initiated the implementation of AMI by installing Smart Meters, Data Management System, and Data Center and Server;
- Level 3 –** refers to DUs that have installed additional Smart Meters; and
- Level 4 –** refers to DUs that have fully implemented AMI technologies.

5.3.3. Advanced Metering Infrastructure. DUs implementing AMI technologies shall undertake the following:

- 5.3.3.1. Consumer Access Rights.** Consumers shall be able to access their own information at any given time of the day through all means of communication provided by the host DU, and shall be properly informed on how to request or receive their available consumption data.
- 5.3.3.2. Data Privacy.** The consumers' detailed energy consumption data shall be protected and shall be treated as highly confidential. The DUs may be allowed to release any available information to third parties upon customer request and approval.
- 5.3.3.3. Consumer-Facing Devices.** The DUs may install additional energy monitoring and control devices, upon consumer request and approval, to encourage consumer interest in energy saving decisions and response to demand; *Provided*, That these technologies shall only be applied in their respective customer premises; *Provided further*, That the provision of additional devices/technologies shall be simple and user-friendly; *Provided finally*, That the DUs may be allowed to charge additional rates, subject to ERC approval, for value-added services.

5.3.4. Consumer Education. The DUs shall conduct programs intended to engage active participation of consumers, through education and information campaigns, including, but not limited to, uses and benefits of SG technologies.

5.3.5. Geographic Information System. The DUs shall update and/or upgrade their GIS in a periodic manner.

- 5.3.6. ESS and DER.** Integrating ESS and DER to any host DU shall be subject to the monitoring and control technologies of the respective level of SG implementation the host DU is categorized into.

The proponent of ESSs and DERs shall further comply with the provisions of relevant ERC Rules and Regulations and DOE Policies.

5.3.7. Electric Vehicle (EV) Charging Stations.

- 5.3.7.1.** In order to promote use of EVs, DUs may establish/facilitate the establishment of charging stations. Private and government instrumentalities can install charging stations under a non-regulatory pricing (prevailing rates) and market-based environment.

- 5.3.7.2.** The DOE, through the SG Inter-Agency Steering Committee (SG-IASC), in collaboration with all the Electric Power Industry Participants, the Department of Transportation, Department of Trade and Industry and all relevant government agencies, shall formulate a long-term National Strategy and Roadmap for EVs and EV Charging Stations, consistent with the Philippine Energy Plan.

5.3.8. Pilot Projects.

- 5.3.8.1.** The DUs that have yet to implement SG technologies are encouraged to conduct demonstration/pilot projects or develop in-house technologies to jumpstart their SG implementation.

- 5.3.8.2.** The DOE and other related government agencies shall actively engage with the DUs in developing demonstration projects to ensure benefit to the future grid, while ensuring consumer protection.

5.4. Information Sharing and Education Campaigns.

- 5.4.1.** The DOE, with the assistance of the stakeholders and other relevant government agencies, shall conduct intensive Information, Education and Communication Campaigns (IECs) to consumers. The campaigns shall address consumer concerns and awareness on matters such as data privacy, energy-saving practices, trends on digitalization and grid modernization, among others.

- 5.4.2.** The campaigns shall clearly explain the benefits of SG, including the advantages of allowing the use of SG infrastructure in their premises. At the same time, the IECs shall aim at empowering customers to make informed decisions that reflect their management and cost of electricity, comfort and environmental preferences.

- 5.4.3. The DOE, in coordination with other government agencies, stakeholders, private companies and academe, shall continue to support information sharing and experience exchanges about SG deployments to promote effective cost-benefit investments and remove information barriers. Centralized public repositories for information and data gathering from SG Conferences, Exhibitions, Seminars and Capacity Buildings are highly encouraged.
- 5.4.4. The DOE and other relevant agencies shall actively participate in various fora and conferences that provide the latest trends and developments in SG implementation to further align and formulate policies related to SG.
- 5.5. **Communication Infrastructure Support.** The DOE, in coordination with relevant government agencies and private companies, shall support the following objectives:
- 5.5.1. Communication Provider – DU/s partnerships are highly encouraged to ensure the appropriate integration of SG information and communication technologies;
- 5.5.2. Reasonable rates, and fast and reliable service by telecommunication companies shall be provided to Electric Industry Participants for SG deployments;
- 5.5.3. The DUs are encouraged to implement all means of communication which are compliant with internationally accepted standards, such as Worldwide Interoperability for Microwave Access (WiMax), Radio Frequency (RF) Mesh, Low-Power Wide-Area Network (LPWAN), and Zigbee technology, among others; and
- 5.5.4. The DOE shall coordinate with the National Telecommunications Commission (NTC) in the allotment of radio frequencies for GenCos, TNP, and DUs to enable the reliable operations of their respective SG deployments.
- 5.6. **Interoperability.**
- 5.6.1. The DOE, through the SG-IASC, shall have the primary responsibility to coordinate with relevant government agencies and stakeholders to develop a framework that includes protocols and technical standards to achieve interoperability of SG deployment.
- 5.6.2. SG interoperability protocols and standards shall align further policies, business models, and technology approaches in a manner that will enable all electric participants to share and use information securely and effectively and to contribute to an efficient, reliable, flexible, secure and technology-neutral SG electricity network.

5.7. Cybersecurity.

- 5.7.1.** To prevent potential cyber-attacks/breach during SG deployments, GenCos, TNP, and DUs shall develop a cybersecurity infrastructure and ensure cost-effective protection.
- 5.7.2.** Cybersecurity infrastructure to be developed shall be compliant with all relevant laws and regulations as well as internationally accepted standards at the appropriate level of adoption and application.

SECTION 6. Duties and Responsibilities. Electric Power Industry stakeholders shall have the following responsibilities:

6.1. Inter-Agency Steering Committee (IASC).

- 6.1.1.** The IASC shall ensure proper and smooth transition of the electric power industry to future SG deployment;
- 6.1.2.** The IASC shall ensure proper coordination and consultation with government agencies, private sectors, academe, and international agencies who have sufficient experience and expertise on all aspects of SG development prior to the issuance of any policy pertinent hereto;
- 6.1.3.** The IASC shall continue to monitor SG initiatives to protect consumer interests, prevent anti-competitive practices, and identify any regulatory or government barriers prior to its deployment;
- 6.1.4.** The IASC shall conduct a regular review of the SDUR and propose amendment, if necessary to ensure up-to-date SG implementation; and
- 6.1.5.** The IASC shall perform all other tasks necessary and incidental for the effective implementation of this Circular, in addition to the provisions of DC2013-03-0003 that are consistent hereto.

6.2. Generation Companies.

- 6.2.1.** The GenCos shall integrate SPG into the transmission or distribution system, consistent with the Power Development Plan.
- 6.2.2.** The design, ownership, operation, and maintenance of any SPG facility shall comply with the provisions of relevant laws, ERC rules and regulations, and policies promulgated by the DOE.

6.3. Transmission Network Provider.

6.3.1. The TNP shall formulate and submit to the DOE and ERC an SG deployment plan and roadmap that includes transmission system enhancement, wide area monitoring systems, automation and network optimization, and long-term interconnection-wide transmission expansion plans, among others.

6.3.2. The SG roadmap to be formulated shall form part of the annual Transmission Development Plan.

6.4. Distribution Utilities.

6.4.1. The DUs shall comply with the levelling structure, in accordance with the National SDUR; *Provided*, That the DUs shall complete the initial levels first before venturing into the succeeding levels, as applicable; *Provided further*, That the DUs shall evaluate their current level of SG implementation in reference to the National SDUR and formulate an SG deployment plan, to be submitted to the DOE and copy furnished ERC; *Provided finally*, That the DUs may request to accelerate or defer their SG deployments, as justified in their business cases, subject to endorsement by the DOE and approval of the ERC.

6.4.2. The DUs shall incorporate all proposed SG projects, in accordance with the SDUR, in the annual update of their respective Distribution Development Plans.

6.5. Market Operator. The Market Operator shall review and/or propose amendments to the WESM rules and Manuals for the possible integration of SG technologies to the wholesale and retail electricity markets.

6.6. System Operator. The SO shall ensure grid reliability and stability during implementation of SG technologies.

SECTION 7. Regulatory and Government Support

7.1. Department of Energy (DOE)

7.1.1. The DOE, through the SG-TWGs, shall prepare and formulate relevant policies and guidelines for SG technologies necessary to improve and support SG implementation;

7.1.2. The DOE shall endorse SG projects to the appropriate agencies or institutions for existing and available direct or indirect subsidies or incentives, such as tax holiday, among others, to be applied with the Bureau of Investments (BOI) and other related government agencies.

- 7.1.3. The DOE shall coordinate with relevant agencies to establish new incentive mechanisms for SG development, if needed.
- 7.1.4. The DOE shall establish strong cooperation and partnership among relevant local and international government agencies, stakeholders, academe, and private entities for SG research, development, and demonstration projects.
- 7.1.5. The DOE shall coordinate with relevant government agencies, specifically with the following:
 - 7.1.5.1. The Department of Science and Technology (DOST) and other research related government agencies to encourage them to undertake research and development that will lead to commercialization and more investments on advanced technologies pertinent to SG.
 - 7.1.5.2. The Department of Trade and Industry, Department of Information and Communications Technology, NTC, DOST and Bureau of Customs, among others, to enjoin them to develop technical standards and safety codes for SG technologies in order to ensure successful and safe deployment in the electric power system.

7.2. Energy Regulatory Commission (ERC).

- 7.2.1. The ERC shall promulgate, within six (6) months from the effectivity of this Circular, related guidelines to ensure proper and timely implementation of the policies set forth herein.
- 7.2.2. The ERC shall review and amend the existing Electric Cooperative Distribution Utility Planning Manual and Investor-Owned Electric Distribution Utility Planning Manual in accordance with the objectives provided in this Circular.
- 7.2.3. The ERC shall develop SG standards to be harmonized into the Philippine Distribution Code and Philippine Grid Code.
- 7.2.4. The ERC, pursuant to its mandate under the EPIRA, shall review all Capital Expenditure (CAPEX) and Operating Expenditure (OPEX) applications filed by the TNP and DUs to ensure efficient and reasonable costs for the effective and timely implementation of SG projects.
- 7.2.5. The ERC shall ensure timely approval of said applications for the recovery of reasonable capital and operating expenditures, taking into consideration the objectives set forth in this Circular, the risk of the technologies becoming obsolete, and all the benefits of SG adoption, such as, but not limited to, customer's energy consumption savings and DU savings.

7.3. National Electrification Administration (NEA)

7.3.1. The NEA shall ensure the provision of concessional loans to SG projects in case of Electric Cooperatives (ECs), subject to other requirements deemed by NEA; and

7.3.2. The NEA shall propose a national strategy for SG deployments to ECs based on current performance assessment and evaluation.

SECTION 8. Repealing Clause. Rules, regulations, policies and all other issuances, as well as the mechanisms and institutions created and responsibilities designated pursuant thereto, that are inconsistent with this Circular are hereby amended, modified or repealed accordingly.

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 IRR shall take effect fifteen (15) days from its publication in at least two (2) newspapers of general circulation and shall remain in effect until otherwise revoked. Certified true 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 _____ 2020 at DOE, Energy Center, Rizal Drive, Bonifacio Global City, Taguig City, Metro Manila.


ALFONSO G. CUSI
Secretary



FEB 06 2020

SMART DISTRIBUTION UTILITY ROADMAP (SDUR)

SMART GRID VISION BY 2040

Level 0

Level 1

Level 2

Level 3

Level 4

- Manually-operated Distribution Network System

- Physical Network Transformation
 - SCADA-Ready Reclosers
 - Sectionalizers
 - Load Break Switches
 - Fault Circuit Indicators
 - Distribution Transformer Monitoring Equipment
 - SCADA System
 - Remote Feeder Lines
 - Remote Substation
 - Implementation of Geographic Information System (GIS)

- Remote voltage regulators, and capacitor banks
- Implementation of Distribution Management System (DMS)
 - Distribution and Substation Automation
- Outage Management System (OMS)
 - Mobile Workforce Management System (MWMS)

- Smart Distribution and Substation Automation
- Advanced Distribution Management System (ADMS)
 - Fault Location, Isolation, and Service Restoration (FLISR)
 - Integrated Volt-Var Optimization (IIVO)

- Full Smart Distribution and Substation Automation

- Conventional Metering

- Implementation of Automated Meter Reading (AMR)

- Initial Implementation of AMI
 - Smart Meters
 - Data Management System
 - Data Center and Server

- Scaling-up AMI deployments

- Full deployment of AMI

- Integration of Energy Storage System (ESS) and Electric Vehicle (EV) Charging Station
- Distributed Energy Resources Integration and Energy Management Systems
 - Consumer Education
 - Updating of GIS
- Interoperability and Cybersecurity
- Telecommunications Infrastructure

Self-healing Grid

Full Customer Choice

Full RCOA, RPS, GEOP and Net Metering Implementation

Optimized ESS, EMS and DER Management System

Virtual Power Plants

Islanding

Demand Response, Demand-Side and Peak Load Management

Smart Homes and Cities

Networks

Customer Service

Continuous/
Parallel Programs