

1 DEPARTMENT CIRCULAR NO. DC2019-__-_____
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4 PROVIDING A NATIONAL SMART GRID POLICY FRAMEWORK FOR THE
5 PHILIPPINE ELECTRIC POWER INDUSTRY AND ROADMAP FOR DISTRIBUTION
6 UTILITIES
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8 **WHEREAS**, Section 2 of Republic Act No. 9136, otherwise known as the Electric Power
9 Industry Reform Act of 2001 (EPIRA), provides that it is a declared policy of the State,
10 among others, to:

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- 12 (a) Ensure the quality, reliability, security and affordability of the supply of electric
13 power;
 - 14 (b) Assure socially and environmentally compatible energy sources and
15 infrastructure;
 - 16 (c) Protect the public interest as it is affected by the rates and services of electric
17 utilities and other providers of electric power; and
 - 18 (d) Encourage the efficient use of energy and other modalities of demand side
19 management.
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24 **WHEREAS**, Section 37 of the EPIRA mandates the Department of Energy (DOE) to
25 supervise the restructuring of the electric power industry and undertake among others,
26 the following:

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- 28 (a) Formulate polices for the planning and implementation of a comprehensive
29 program for the efficient supply and economical use of energy consistent with
30 the approved national economic plan and with the policies of environmental
31 protection and conservation and maintenance of ecological balance, and
32 provide a mechanism for the integration, rationalization and coordination of the
33 various energy programs of the Government;
 - 34 (b) Prepare and update annually a Power Development Program (PDP) and
35 integrate the same into the Philippine Energy Plan (PEP). The PDP integrate
36 the individual or joint development plans of the generation, transmission, and
37 distribution sectors of the electric power industry.
 - 38 (c) Ensure the reliability, quality and security of supply of electric power; and
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 - 40 (d) Facilitate and encourage reforms in the structure and operations of distribution
41 utilities (DUs) for greater efficiency and lower costs;
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45 **WHEREAS**, Smart Grid uses innovative technologies to modernize electric grid
46 infrastructure to effectively address 21st century challenges of consumer empowerment,
47 energy supply flexibility and security, electric grid performance and asset utilization and
48 environmental protection;

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WHEREAS, on 11 March 2013, the DOE promulgated Department Circular 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”; with 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) with following deliverables:

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

WHEREAS, the DOE envisions that there is a need 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 towards grid modernization and consumer empowerment, as envisioned in PEP 2040 and PDP 2040 in support to the national economic development goal towards Ambisyon Natin 2040;

WHEREAS, in order to support and implement the mandates of the Inter-Agency Steering Committee, the DOE issued Special Order No. SO2018-10-0057, dated 17 April 2018, entitled, “Creating the Department of Energy Smart Grid Technical Working Group”, 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);

97 **WHEREAS**, the DUs have adopted and implemented level of Smart Grid initiatives in
98 their operations considering, but not limited to, the following:
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- 100 (a) A need to upgrade the electricity grid ensuring its reliability and resiliency;
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- 102 (b) Higher customer demand and expectations;
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- 104 (c) Increasing penetration of Variable Renewable Energy (VRE) Sources and
105 growing deployment of Electric Vehicles (EVs);
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- 107 (d) Improvement of energy and power system efficiency and flexibility; and
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- 109 (e) To achieve full implementation of Retail Competition and Open Access
110 (RCOA), Renewable Portfolio Standards (RPS), Green Energy Option
111 (GEOP), and Net Metering;
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113 **WHEREAS**, on 19 April 2019, the Republic Act No. 11285 or the Energy Efficiency and
114 Conservation Act (EECA) was signed to implement the energy efficiency and
115 conservation plans and programs of the Department of Energy on the national level;

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

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

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

129
130 **1.1. Safety / Reliability**

131 Improve grid reliability and ensure that the performance of the Power System will
132 result in electricity being delivered to the customers, within accepted standards, and
133 without any adverse effects to the system, while maintaining optimal operation of
134 the grid;

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136 **1.2. Efficiency**

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

139
140 **1.3. Flexibility / Sustainability**

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

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145 **1.4. Resiliency**

146 Improve the ability of the grid, exposed to hazards, to resist, absorb, accommodate
147 and recover from the effects of a hazard in a timely and efficient manner, through
148 the preservation and restoration of its essential basic structures and functions; and
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150 **1.5 Consumer Empowerment**

151 Improve consumer awareness and engagement through monitoring and managing
152 energy consumption and promote new emerging technologies such as electric
153 vehicles, net metering, smart monitoring equipment and appliances, among others.
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155 Towards this end, it is envisioned that the Philippines will reach a level of Smart Grid
156 development capable of the following:

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- 158 (a) Self-healing grid;
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 - 160 (b) Full Implementation of Retail Competition and Open Access (RCOA),
161 Renewable Portfolio Standards (RPS), Green Energy Option (GEOP), and Net
162 Metering;
 - 163
 - 164 (c) Full Customer Choice;
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 - 166 (d) Demand Response and Peak Load Management;
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 - 168 (e) Optimized Energy Storage Systems (ESSs), Energy Management Systems
169 (EMSs), and Distributed Energy Resources (DERs) Management Systems;
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 - 171 (f) Virtual Power Plant Integration; and
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 - 173 (g) Smart Homes and Cities.
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175 **SECTION 2. Definition of Terms.** The terms as used in this Circular shall have their
176 respective meanings as follows:

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178 **2.1. “Advanced Distribution Management System” or “ADMS”** - refers to a platform
179 that integrates hardware and multiple utility-based systems which provides
180 automated outage restoration and optimization of distribution grid performance.
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182 **2.2. “Advanced Metering Infrastructure” or “AMI”** – refers to an integrated system of
183 smart meters, communications networks, and data management systems that
184 enables two-way communication between utilities and its customers. Customer
185 systems may include in-home displays, home area networks, energy management
186 systems, and other customer-side-of-the-meter equipment that enable smart grid
187 functions in residential, commercial, and industrial facilities;
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189 **2.3. “Cybersecurity”** – refers to a collection of tools, policies, security concepts, security
190 safeguards, guidelines, risk management approaches, actions, training, best
191 practices, assurance and technologies that can be used to protect the cyber
192 environment, the organization and user’s assets;

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- 2.4. “Demand Response” or “DR”** – refers to a mechanism in which the utility can 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 is sought through incentives and penalties;
- 2.5. “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.
- 2.6. “Distributed Energy Resources” or “DER”** – refers to smaller power sources that could be aggregated to provide power necessary to meet regular demand.
- 2.7. “Distribution Management System” or “DMS”** – refers to a collection of software applications designed to monitor and control the entire distribution network efficiently and reliably;
- 2.8. “Distribution Automation” or “DA”** – 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;
- 2.9. “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;
- 2.10. “Electric Power Industry Reform Act of 2001” or “EPIRA”** – refers to Republic Act No. 9136;
- 2.11. “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;
- 2.12. “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;
- 2.13. “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;
- 2.14. “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.

- 240 **2.15. “Grid”** – refers to the high voltage backbone system of interconnected transmission
241 lines, substations and related facilities, located in Luzon, Visayas and Mindanao, or
242 as may be determined by the Energy Regulatory Commission (ERC) in accordance
243 with Section 45 of the EPIRA;
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- 245 **2.16. “Islanding”** – refers to a condition in which a power system, consisting of DU/s,
246 power source/s and load/s, continues to operate whenever the power from the grid
247 is no longer present;
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- 249 **2.17. “Micro-grid System”** – refers to a group of interconnected loads and DERs within
250 clearly defined electrical boundaries that acts as a single controllable entity with
251 respect to the grid. A micro-grid can connect and disconnect from the grid which
252 enables it to operate both in grid-connected or in island-mode;
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- 254 **2.18. “Mobile Workforce Management System” or “MWMS”** – refers to a system
255 platform that enables a utility to allot maintenance jobs to the crews in the field on
256 real-time basis. Information on the type of fault is made available on the Mobile to
257 support troubleshooting. Good mobile workforce management applications will have
258 real-time scheduling engine integrated to the GIS;
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- 260 **2.19. “Outage Management System” or “OMS”** – refers to a utility network management
261 software application that models network topology for safe and efficient field
262 operations related to outage restoration. OMSs tightly integrate with call centers to
263 provide timely, accurate, customer-specific outage information, as well as
264 supervisory control and data acquisition (SCADA) systems for real-time confirmed
265 switching and breaker operations. These systems track, group, and display outages
266 to safely and efficiently manage service restoration activities;
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- 268 **2.20. “Building Energy Management System” or “BEMS” / “Home Energy
269 Management System” or “HEMS”** – refers to a computer-based control system
270 installed in houses or buildings that controls and monitors mechanical and electrical
271 equipment such as air-conditioning and ventilation, lighting, water heaters, pumps,
272 other power consuming equipment, fire protection and security systems;
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- 274 **2.21. “Smart Grid”** – refers to a modernized electrical grid that utilizes innovative
275 technologies with two-way and/or multi-way communication technologies, real-time
276 monitoring and control systems to:
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- 278 **2.21.1.** Improve overall reliability, power quality, security, efficiency and
279 management of the electricity grid with full cybersecurity and
280 interoperability;
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- 282 **2.21.2.** Allow suitable integration of bulk and flexible generation, distributed energy
283 resources, micro-grids, and electric vehicles with management systems;
284 and
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- 286 **2.21.3.** Empower customers with the provision of timely information and control
287 options through enhanced energy management systems.

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289 **2.22. “Smart Home / Building”** – refers to a house or building that is capable of
290 monitoring and control of the electricity/energy usage within its premises;
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292 **2.23. “Smart Appliances / Devices”** – refers to real-time, automated, interactive
293 technologies that optimize the physical operation of appliances, communication
294 technologies, and consumer devices;
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296 **2.24. “Smart Meter”** – refers to an electronic real-time energy-measuring device that is
297 capable of remote connect/disconnect switching and has two-way communication
298 between the meter and the utility. A smart meter records consumption of electric
299 energy in intervals of an hour or less and communicates that information back to the
300 utility for monitoring and billing;
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302 **2.25. “Supervisory Control and Data Acquisition” or “SCADA”** – refers to a system of
303 software and hardware components that allows to:
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305 **2.25.1.** Control processes locally or at remote locations;
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307 **2.25.2.** Monitor, gather, and process real-time data;
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309 **2.25.3.** Directly interact with equipment through human-machine interface software;
310 and
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312 **2.25.4.** Record events into a log file;
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314 **2.26. “Substation Automation” or “SA”** – refers to an integrated system that enables
315 an electric utility to automate and remotely monitor, control and coordinate the
316 distribution components installed in the substation. SA has been focused on
317 automation functions such as monitoring, controlling, and collecting data inside the
318 substations;
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320 **2.27. “Virtual Power Plant” or “VPP”** – refers to a network of aggregated decentralized,
321 medium-scale power generating units such as, but not limited to, Combined Heat
322 and Power (CHP) units, wind farms, solar PVs, flexible power consumers/prosumers
323 and energy storage systems. The interconnected units will be dispatched through
324 the central control room of the VPP. These VPPs aim to relieve the load on the grid
325 by intuitively distributing the aggregated power generated by the individual units;
326 and
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328 **2.28. “Wide Area Monitoring System” or “WAMS”** – refers to a system to improve
329 situational awareness and visibility within the grid. With Phasor Measurement Units
330 (PMU) that are capable of fast and accurate measurements, the grid records
331 synchro-phasor data that is accurately timestamped.
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333 **SECTION 3. Scope and Coverage.** This Circular shall apply primarily to Distribution
334 Utilities (DUs), including grid-connected, micro-grids and off-grid systems. This shall be
335 supported and linked to the following Electric Power Industry Participants:

- 336
337 **3.1.** Generation Companies (GenCos);
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339 **3.2.** Transmission Network Provider (TNP);
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341 **3.3.** Customers / End-users which include:
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343 **3.3.1.** Utility Customers, and
344 **3.3.2.** Non-Utility Customers;
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346 **3.4.** System Operator (SO);
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348 **3.5.** Market Operator (MO); and
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350 **3.6.** Market Governance.
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352 **SECTION 4. Overall Framework and Infrastructure.** The framework and infrastructure
353 of the SG shall be comprised of the following major sectors:
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- 355 **4.1. Smart Power Generation.** The Smart Power Generation (SPG) shall be
356 envisioned as secure, fast, dynamic, flexible, and efficient resource capacity by
357 integrating new and emerging technologies into the Generation Sector. This
358 includes, among others, the use of DERs, Micro-grids, Hybrid Systems, ESSs, and
359 Flexible Generation.
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361 The use of advance monitoring systems in power generation facilities is seen to
362 contribute in lessening power plant outages and improve plant maintenance
363 scheduling. Improvements in forecasting and generation planning are also
364 expected as modern software is capable of handling multiple parameters.
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- 366 **4.2. Transmission Modernization.** The modernized transmission grid shall have the
367 following features, but not limited to:
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- 369 4.2.1. Wide Area Monitoring and Control;
370 4.2.2. Regional Frequency and Voltage Stability Control;
371 4.2.3. Full Transmission Automation; and
372 4.2.4. Island-to-Grid interconnection.
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374 The integration of SG in the transmission system is envisioned to improve system
375 efficiency and minimize losses in the transfer of electricity from one node to
376 another. This development will allow adequate response to grid disturbances and
377 address grid resiliency.
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- 379 **4.3. Smart Distribution Utility.** The Smart Distribution Utility (SDU) shall be
380 envisioned with reliable, flexible, resilient and secure automated distribution
381 system integrated with decentralized energy sources. This modernized distribution
382 system is expected to promote consumer empowerment and energy efficiency and
383 conservation.

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This shall be guided with the Smart Distribution Utility Roadmap (SDUR) as indicated herein as Annex A.

4.3.1. Levelling. In particular, the SG Roadmap per level are presented as follows:

Level 0 – DUs that have yet to initiate any SG plans and programs and considered with manually-operated DU system shall be referred to as Level 0 SDU.

Level 1 – DUs that have started to enhance their physical network configuration by installing and integrating reclosers, sectionalizers, load break switches, fault locators, SCADA system, and GIS into their system, shall be referred to as Level 1 SDU.

Level 2 – DUs moving towards a more efficient system to address power outages and disturbances by installing remote voltage regulators and capacitor banks and partially integrating DMS, OMS, and MWMS into their system, shall be referred to as Level 2 SDU.

Level 3 – DUs integrating automated technologies such as FLISR and ADMS with DA and SA into their system, shall be referred to as Level 3 SDU.

Level 4 – DUs that have obtained full DA, SA and is capable of islanding, shall be referred to as Level 4 SDU.

The ERC, in collaboration with DOE, shall conduct an assessment to validate the submission of the DUs following the promulgation of this Circular.

4.3.2. Advanced Metering Infrastructure Deployment. AMI technologies shall be deployed in accordance with the SDUR presented herein Annex A.

The DUs implementing AMI and other related technologies linking the consumer sector shall undertake the following:

4.3.2.1. 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.

4.3.2.2. Data Privacy. The consumers' detailed energy consumption data shall be protected and treated as highly confidential. The

432 DUs may be allowed to release any available information to
433 third parties upon customer request and approval.

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435 **4.3.2.3. Consumer-Facing Devices.**

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437 **4.3.2.3.1.** The DUs may install additional energy monitoring
438 and control devices, encouraging consumer
439 interest in energy saving decisions and response to
440 demand.

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442 **4.3.2.3.2.** The DUs may be allowed to charge additional rates
443 subject to ERC approval, for value-added services.
444 To avoid confusion and information overload to
445 consumers, provision of additional
446 devices/technologies shall be simple and user-
447 friendly.

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449 **4.3.3. Continuous Programs and Initiatives.** The DUs shall conduct programs
450 intended to engage active participation of consumers, through education
451 and information campaigns that presents the uses and benefits of SG
452 technologies.

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454 **4.3.4. Geographic Information System.** The DUs shall update and/or upgrade
455 their GIS in a timely manner.

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457 **4.3.5. ESS and DER.** Integrating ESS and DER to any host DU shall be subjected
458 to any level of SG implementation. However, the proponent of ESSs and
459 DERs shall comply with the provisions of relevant ERC Rules and
460 Regulations and DOE Policies.

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462 **4.3.6. Electric Vehicle (EV) Charging Stations.**

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464 **4.3.6.1.** In order to promote the deployment of EVs, DUs may establish
465 charging stations, subject to the rates, rules and regulations set
466 forth by the ERC.

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468 **4.3.6.2.** The DOE, through the SG Inter-Agency Steering Committee (SG-
469 IASC), in collaboration with all the Electric Power Industry
470 Participants and all relevant government agencies, shall formulate
471 a long-term National Strategy and Roadmap for EVs and EV
472 Charging Stations, consistent with the Philippine Energy Plan.

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474 **4.3.7. Pilot Projects.**

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476 **4.3.7.1.** The DUs that have yet to implement SG technologies are
477 encouraged to conduct demonstration/pilot projects or develop in-
478 house technologies on various initiatives to jumpstart their SG
479 implementation.

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4.3.7.2. 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.

4.4. Information Sharing and Education Campaigns.

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

4.4.2. 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.

4.4.3. The DOE, in coordination with other government agencies, stakeholders, private companies and academe, shall continue to support information sharing from SG deployments and experiences to promote effective cost-benefit investments and remove information barriers. Providing centralized public repositories for information and data gathering from SG Conferences, Exhibitions, Seminars and Capacity Buildings are highly encouraged.

4.4.4. The DOE and other relevant agencies shall actively participate in fora and conferences that provide the latest trends and developments in SG implementation to further align and formulate policies related to SG.

4.5. Communication Infrastructure Support. The DOE, in coordination with relevant government agencies, shall support the following objectives:

4.5.1. Communication Provider – DU/s partnerships are highly encouraged to ensure the appropriate integration of SG communication technologies;

4.5.2. Reasonable rates, fast and reliable service by telecommunication companies shall be provided to Electric Industry Participants for SG deployments;

4.5.3. The DUs are encouraged to implement all means of communication with internationally accepted standards such as Worldwide Interoperability for Microwave Access (WiMax), Low-Power Wide-Area Network (LPWAN), and Zigbee technology, among others; and

4.5.4. The DOE shall coordinate with the National Telecommunications Commission (NTC) in the grant of dedicated radio frequencies for GenCos,

528 TNP and DUs to enable the latter's smart grid deployments to operate
529 reliably.

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531 **4.6. Interoperability.**

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533 **4.6.1.** The DOE, through the SG-IASC, shall have primary responsibility to
534 coordinate with the relevant government agencies and stakeholders to
535 develop a framework that includes protocols and technical standards to
536 achieve interoperability of SG deployment.

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538 **4.6.2.** SG interoperability protocols and standards shall further align policy,
539 business models, and technology approaches in a manner that would
540 enable all electric participants to contribute to an efficient, reliable, flexible,
541 secure and technology-neutral SG electricity network.

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543 **4.7. Cybersecurity.**

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545 **4.7.1.** Recognizing the rise of potential cyberattacks/breach while implementing
546 SG deployments, Generation Companies, TNP, and DUs, venturing towards
547 SG, shall develop a cybersecurity infrastructure and ensure cost-effective
548 protection. Precautionary measures shall be employed to prevent, detect,
549 and respond to cyberattacks, mitigate and recover when such attacks arise.

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551 **4.7.2.** Cybersecurity infrastructure to be developed shall be compliant with all
552 relevant laws and regulations as well as internationally accepted standards
553 at the appropriate level of adoption and application.

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555 **SECTION 5. Duties and Responsibilities.**

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557 **5.1. Inter-Agency Steering Committee (IASC).**

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559 **5.1.1.** The IASC shall ensure proper and smooth transition of the electric power
560 industry to future SG deployment;

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562 **5.1.2.** The IASC shall ensure proper coordination and consultation with
563 government agencies, private sectors, academe and international agencies
564 who have sufficient experience and expertise on all aspects of SG
565 development prior to the issuance of any policy; and

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567 **5.1.3.** The IASC shall continue to monitor SG initiatives to protect consumer
568 involvement, prevent anticompetitive practices and identify any regulatory
569 or government barriers prior to deployment.

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571 **5.2. DOE Smart Grid Technical Working Group (SG-TWG).** The SG-TWG created
572 under Special Order No. SO2018-10-0057, shall have the following functions:

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5.2.1. Power Systems Operations

- 5.2.1.1.** Shall prepare and formulate relevant policies, roadmaps, and frameworks for SG technologies needed to improve power system operations;
- 5.2.1.2.** Shall coordinate SG development efforts with energy infrastructure resiliency measures;
- 5.2.1.3.** Shall encourage use of planning and simulation softwares related to power system operations that will aid the implementation of SG initiatives;
- 5.2.1.4.** Shall coordinate with various sectors to ensure improvement in the provision of services as SG deployment increases; and
- 5.2.1.5.** Shall assess regularly the implementation of the roadmap and provide the necessary updates.

5.2.2. Sustainable and Renewable Energy

- 5.2.2.1.** Shall determine improvement in existing RE mechanisms as SG integration advances;
- 5.2.2.2.** Shall develop strategies that will address grid integration of renewable energy sources to the grid;
- 5.2.2.3.** Shall encourage technologies and systems that will address varying output of Variable Renewable Energy plants; and
- 5.2.2.4.** Shall develop a national strategy for the integration of DER and implementation of micro grids.

5.2.3. Information and Communications Technology and Cybersecurity

- 5.2.3.1.** Shall determine and assess current level of ICT infrastructure available in the country;
- 5.2.3.2.** Shall develop a national strategy for the development of SG cybersecurity infrastructure; and
- 5.2.3.3.** Shall facilitate implementation of ICT improvements and cybersecurity infrastructure in collaboration with the Department of Information and Communications Technology (DICT) and other concerned government agencies.

5.2.4. Standardization

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- 5.2.4.1.** Shall take the lead and coordinate with relevant government agencies and stakeholders and lead the development on SG interoperability framework, standards and protocols.
 - 5.2.4.2.** Shall develop a database of internationally recognized technical standards and protocols for SG and their applications for developers, consumers, and service providers;
 - 5.2.4.3.** Shall provide an assessment of the standards and protocols that can be adopted in each phase of SG development and deployment in the country;
 - 5.2.4.4.** Shall formulate a long-term National Strategy and Roadmap for EVs and EV Charging Stations, consistent with the Philippine Energy Plan; and
 - 5.2.4.5.** Shall facilitate entry and deployment of EVs through coordination with the Department of Transportation (DOTr) and other concerned government agencies.

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5.2.5. Regulatory Support

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- 5.2.5.1.** Shall determine the necessary support policies that must be issued in accordance with the objectives set forth in this Circular;
 - 5.2.5.2.** Shall coordinate with the ERC to harmonize rules and regulations that affects the implementation of SG;
 - 5.2.5.3.** Shall review existing laws, DOE policies, ERC rules and regulations relating to SG and recommend necessary amendments, if any, to facilitate SG development; and
 - 5.2.5.4.** Shall coordinate with relevant agencies to establish new incentive mechanisms for SG development, if needed.

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5.2.6. Consumer Empowerment

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- 5.2.6.1.** Shall prepare and formulate relevant SG policies linking the end-user sector;
 - 5.2.6.2.** Shall develop and conduct information and education campaigns that will increase opportunity for end-users to participate in energy efficiency management;
 - 5.2.6.3.** Shall identify the necessary consumer related laws and issuances that will ensure customer's data privacy; and

671 **5.2.6.4.** Shall determine necessary issuances that will allow full disclosure
672 of own personal data requested by the consumer.
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674 The DOE SG-TWG shall issue necessary guidelines, within ninety (90) days from
675 the effectivity of this Circular, to support the SG Vision.
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677 **5.3. Generation Companies.**
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679 **5.3.1.** The Generation sector shall integrate SPG into the transmission or
680 distribution system, consistent with the Power Development Plan.
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682 **5.3.2.** The design, ownership, operation and maintenance of any SPG facility shall
683 comply with the provisions of relevant laws, ERC Rules and Regulations,
684 and Policies promulgated by the DOE.
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686 **5.4. Transmission Network Provider (TNP).**
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688 **5.4.1.** The TNP shall formulate and submit to the DOE and ERC a SG deployment
689 plan and roadmap that includes transmission system enhancement, wide
690 area monitoring systems, automation and network optimization, and long-
691 term interconnection-wide transmission expansion plans, among others.
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693 **5.4.2.** The SG roadmap to be formulated shall form part of the annual
694 Transmission Development Plan.
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696 **5.5. Distribution Utilities.** The DUs shall undertake the following:
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698 **5.5.1.** Comply with the leveling structure in accordance with the SDUR; Provided
699 that the DUs shall complete the initial levels first before venturing into the
700 succeeding levels, as applicable; Provided further that the DUs shall
701 evaluate their current level of SG implementation in reference to the SDUR
702 and formulate a SG deployment plan, to be submitted to the DOE and copy
703 furnished ERC.
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705 **5.5.2.** Incorporate all proposed SG projects, in line with the SDUR, in the annual
706 update of the Distribution Development Plan.
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708 **SECTION 6. Regulatory and Government Support**
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710 **6.1. Department of Energy (DOE)**
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712 **6.1.1.** The DOE shall endorse SG projects to appropriate agencies or institutions
713 for existing direct or indirect subsidies or incentives provided by the
714 Government such as Tax holiday to be applied in the Board of Investments
715 (BOI).
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717 **6.1.2.** The DOE shall coordinate with relevant agencies to establish new incentive
718 mechanisms for SG development, if needed.

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6.1.3. 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.

6.2. Energy Regulatory Commission (ERC)

6.2.1. The ERC is hereby enjoined to promulgate, within six (6) months from effectivity of this Circular, related guidelines and to ensure proper and timely implementation of the policies set forth herein.

6.2.2. Further, the ERC shall review and amend the existing Electric Cooperative Distribution Utility Planning Manual and Investor-Owned Electric Distribution Utility Planning Manual in accordance to the objectives provided herein this Circular.

6.2.3. The ERC, pursuant to its mandate under the EPIRA, shall review all Capital Expenditure (CAPEX) and Operating Expenditure (OPEX) filed by the TNP and DUs to ensure efficient and reasonable costs for the effective and timely implementation of SG projects.

6.2.4. The ERC shall ensure timely approval of said applications for the recovery of reasonable capital and operating expenditures, taking into consideration all benefits of SG adoption (e.g. customer’s energy consumption savings, DU savings) and objectives set forth in this Circular, and reducing the risk of technologies becoming obsolete.

6.3. National Electrification Administration (NEA)

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

6.4. Other Government Agencies

6.4.1. The Department of Science and Technology (DOST) and other research-related government agencies are highly encouraged to invest more on advanced technologies, research and development that will lead to commercialization.

6.4.2. To ensure successful and safe deployment of SG technologies in the electric power industry, government agencies, including but not limited to the ERC, NTC, Department of Trade and Industry, DOST, DICT and Bureau of Customs are enjoined to develop technical standards and safety codes for SG technologies implementation.

765 **SECTION 7. Repealing Clause.** Nothing in this Circular shall be construed as to amend,
766 supersede, or repeal any of the mechanism or institutions already existing or
767 responsibilities already allocated and provided for under any existing laws, rules, or
768 contracts.

769 **SECTION 8. Separability Clause.** If for any reason, any section or provision of this
770 Circular is declared unconstitutional or invalid, the other parts or provisions hereof which
771 are not affected thereby shall continue to be in full force and effect.

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773 **SECTION 9. Effectivity.** This Department Circular shall take effect immediately after its
774 publication in two (2) newspapers of general circulation, and copies of this Circular shall
775 be filed with the University of the Philippines Law Center-Office of the National
776 Administrative Register.

777
778 Signed this _____ day of _____, 2019 at DOE, Energy Center, Rizal
779 Drive, Bonifacio Global City, Taguig City, Metro Manila.

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784 **ALFONSO G. CUSI**
785 *Secretary*
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