Chapter VI.
POWER DEVELOPMENT

Power sector development plays an invaluable role in fuelling the economy and nation building. The country's electric power industry is governed by Republic Act (RA) No. 9136 or the Electric Power Industry Reform Act (EPIRA) of 2001 that envisions a regime of a liberalized power industry towards fully achieving a competitive and a market-driven electricity sector. EPIRA's goals and objectives were further strengthened by RA No. 9513 or the Renewable Energy (RE) Act of 2008 that pushes the utilization of indigenous and new renewable energy resources to increase energy self-sufficiency and reduce dependence on imported fuels.

As the power sector continuously evolves along with technology innovation, the DOE remains committed with its mandate of formulating plans, programs, and policies to usher the sector's unimpeded growth. This translates to a number of benefits such as ensuring economic stability, creation of wealth for communities and the people, and consumer empowerment, among others.

To heed the Administration's call for inclusive growth and development, the DOE aligns its power-related development plans with the Philippine Development Plan (PDP) 2017-2022, the *"Build, Build, Build, Infrastructure"* Program and Ambisyon 2040, as a converging strategy to fast-track the attainment of the President's priority thrusts and agenda.

In addition, the DOE crafted power sector roadmaps that encapsulates the generation, transmission, distribution and supply subsectors, including missionary and household electrification. The subsector roadmaps outline the various strategies and approaches of the DOE, which are targeted for implementation in the short- up to the long-term period. Each of the roadmaps are anchored on the power sector's overall objectives by 2040 which aims to: 1) ensure quality, reliable, affordable and secure supply; 2) expand access to electricity; 3) ensure a transparent and fair playing field in the power industry; and 4) accelerate total electricity access in the country.

A. EXISTING POWER SYSTEM

The Philippines is an archipelago made up of 7,641 islands. With its geographical nature, the country's electricity network is characterized by grid and off-grid power systems. The main grid is composed of three (3) sub-grids, namely, the Luzon and Visayas grids that are already interconnected via submarine cable, and the Mindanao grid which remains an independent grid anticipating the completion of the Mindanao-Visayas Interconnection Project (MVIP). Once

completed, the major grids can benefit from sharing of available capacities as a *"One Grid Philippines"*.

- **Main Grid**

In 2018, the main grid recorded a peak demand of 14,782 megawatts[68] (MW). There are 235 generating facilities that operates and supplies power, with a total installed capacity of 23,281 MW[69] and a dependable capacity of 20,825 MW. Gross power generation in the same period stood at 98,308 gigawatt-hour[70] (GWh). More than half (52.8 percent) of the electricity produced were sourced from coal-fired power plants while 21.7 percent came from natural gas. Renewable-based generation such as geothermal, hydro, biomass and variable solar and wind power plants contributed 23.7 percent of total power generation. Meanwhile, roughly 1.8 percent of electricity generated were supplied by oil-based power plants.

Electricity generated by the power plants is delivered at a higher voltage through the transmission system. The existing transmission assets with total substation capacity of 34,852 Megavolt-Ampere (MVA) and combined transmission line length of 20,505 circuit-kilometers (ckt-kms) are owned by the Government through the National Transmission Corporation (TransCo). It is being operated and maintained by privately-owned National Grid Corporation of the Philippines (NGCP) by virtue of RA 9511 or the NGCP Franchise Law for a period of 50 years. Under the said franchise, the initial concession agreement between NGCP and the Government is for a duration of 25 years that can be renewed for another 25 years.

Distribution Utilities (DUs) distributes electricity to the end-users. As of 2018, the National Electrification Administration (NEA) supervises the operation of 100 Electric Cooperatives (ECs), while the 24 Private Investor Owned Utilities (PIOUs) and Enerzones[71] including the two (2) LGU-Owned Utilities (LGUOUs) directly reports to DOE. During the period, total electricity sales or the amount of electricity consumed by the end-users of DUs in the main grid was 76,359 GWh[72]. The residential and commercial sectors are among the largest power users, which accounts for 36.2 percent and 31.1 percent of total consumption, respectively. Electricity consumption of the industrial sector closely follows at 30.5 percent, while the remaining 2.3 percent was accounted for the "others" sector that corresponds to the electricity used by public buildings and streetlights.

- **Off-Grid**

Off-grid power systems or "missionary areas" are those that are not yet connected to the main grid. These are typically small islands and isolated grids (SIIGs) whose electricity supply is being provided majority by the National Power Corporation (NPC), privately-owned New Power Providers (NPPs) for relatively large off-grid islands and some Qualified Third Party (QTP) providers servicing far-flung and remote areas.

For the period in review, there are 181 power generation facilities in missionary areas. Of the total power plants, 139[73] are from NPC-SPUG, 32 from NPPs, six (6) are DU-owned and four (4) from QTPs. Existing power plants have a total installed capacity of 534 MW and a dependable capacity of 416 MW[74]. In terms of power generation, total power produced reached 1,456 GWh[75]. About

[68] In 2019, the main grid recorded a peak demand of 15,581 MW
[69] In 2019, the main grid has a total installed capacity of 25,006 MW and total dependable capacity of 22,317 MW
[70] The 2019, gross power generation of the main grid reached 104,417 GWh
[71] Enerzones are duly authorized entities operating within economic zones
[72] In 2019, electricity sales of the main grid were 81,237 GWh, excluding directly connected customers (DCC)
[73] Excluding the 135 small-scale power plants in the PRES mini-grids
[74] In 2019, off-grid power plants have a total installed capacity of 526 MW and a dependable capacity of 419 MW
[75] In 2019, gross power generation in off-grid areas reached 1,623 GWh

97.1 percent were sourced from oil-based power plants, with a little portion from RE-based generation facilities particularly mini-hydro that contributed about 2.9 percent of the gross generation.

Aside from generating facilities, NPC owns, manages and operates the transmission and substation assets of the Government, with total substation capacity of 185 MVA and 776 ckt-kms of transmission lines. On the other hand, NEA administers and supervises 21 Off-grid ECs while the DOE directly oversees one (1) Multi-purpose Cooperative (MPC) and one (1) LGUOU that act as local distribution utilities in SIIGs.

The 2018 electricity consumption of the off-grid end-users was 1,163[76] GWh, which is 1.5 percent compared to the electricity consumption of the main grid. Of these total, the residential sector accounts for the largest share of 55.9 percent. Meanwhile, the shares of the commercial, industrial and other sectors accounted for 25.7 percent, 7.9 percent and 10.5 percent of total power consumption, respectively.

B. GENERATION

The power generation sector's roadmap articulates short- to long-term strategies anchored on the government's overarching thrust and energy agenda of achieving power supply security, reliability, and sustainability throughout the country. It forms as an integral part of the holistic approach towards realizing the full restructuring and reform of the electric power industry in support of national development.

ASSESSMENT

For the short-term period, the DOE has taken strategic strides to attain these key targets outlined in the roadmap. Relatedly, the electric power industry also welcomed milestone developments, new policy directions and crucial interventions that are instrumental in meeting the envisioned goals and outcomes of the sector.

1. *Declare Power Projects as Project of National Significance*

The promulgation of Executive Order No. 30 (EO30) titled "*Creating the Energy Investment Coordinating Council (EICC) in Order to Streamline the Regulatory Procedures Affecting Energy Projects*" is a paramount development in the energy sector, particularly in securing a conducive business environment for energy investments. The EO's Implementing Rules and Regulations (IRR) was issued in April 2018 to provide the framework and guidelines, including the process flow in reviewing, evaluating and endorsing energy projects as "Energy Project of National Significance" (EPNS).

Through this landmark executive issuance, the establishment of a simplified and streamlined regulatory process essentially benefited the electric power industry investors in pursuing and expediting the implementation of proposed power infrastructure projects that are vital in ensuring the country's energy security.

Two (2) power generation projects have been granted with a Certificate of Energy Project of National Significance (CEPNS), namely:

- The Atimonan One Energy 2 x 600 MW Coal-fired Power Project, and
- The Energy World Corporation 650 MW Combined Cycle Gas Turbine Power Project with Liquefied Natural Gas

[76] In 2019, total electricity sales in off-grid areas reached 1,278 GWh

(LNG) Import Terminal and Regasification Facility.

- ***Exempt Real Property Tax (RPT) and Local Taxes***

In fulfillment of its mandate to provide a sustainable and reasonably-priced energy for the people, the DOE continues to establish strategies to make electricity costs more competitive. Among the identified measures being considered by the DOE include the relaxation of government tariffs, such as exemption from real property and other local taxes being imposed by the Local Government Units (LGUs) to the power generation companies.

In 2018, the DOE fully supported the Department of Finance (DOF) in proposing for an Executive Order mandating the reduction and condonation of real property taxes, interests and penalties for CY2017. The proposed EO will cover the power generation facilities of the Independent Power Producers (IPPs) under the Build-Operate-Transfer (BOT) contracts with the Government Owned and Controlled Corporations (GOCCs). It also intends to relieve the burden of the privatized IPPs that are yearly encountering problems on the assessment and payment of real property tax to the concerned LGUs. This initiative is in relation to the administration of IPP contracts, as part of the major functions of the Power Sector Assets and Liabilities Management (PSALM) Corporation wherein the DOE sits as one of the agency's Board of Directors.

- ***Grant Business Permits and Licenses to Operate***

The DOE evaluates, processes and issues necessary endorsements and certifications including permits and licenses to operate, which form part of the basic requirements of other government agencies relative to the construction of new power generating facilities. For the period in review, the DOE granted a total of 272 clearances in 2017 and endorsed 261 power projects in 2018 as presented in *Table 29.*

Table 29. NUMBER OF CLEARANCES/ENDORSEMENTS ISSUED TO POWER GENERATION COMPANIES, 2017-2018

Requesting Agency	Type of Clearance/Certificate	2017	2018
Securities and Exchange Commission (SEC)	Certificate of Endorsement (COE) for Company Registration/Incorporation	160	117
National Grid Corporation of the Philippines (NGCP)	Clearance to Undertake System Impact Study (SIS)	73	84
Energy Regulatory Commission (ERC)	COE for the issuance of ERC Certificate of Compliance (COC)	30	46
National Commission on Indigenous Peoples (NCIP)	Certificate of Non-Overlap (CNO) / Certificate of Precondition (CP)	9	14
Total		**272**	**261**

2. *Institute Power Mix Policy for Power Generation towards Optimal Portfolio*

The DOE remains cognizant with its crucial role in empowering the nation by ensuring the delivery of stable, secure, sufficient and accessible energy supply. In carrying out this mandate, the DOE firms up its strategies by instituting an appropriate power mix for electricity generation, which considers an optimal supply portfolio that meets the growing electricity demand including the reserve requirements of the grid. The optimal portfolio constitutes the required baseload, mid-merit and peaking power plant capacities based on least-cost options.

Parallel with this policy thrust, the DOE regularly formulates, on an annual basis, the power demand-supply outlook using a simulation software that provides optimal capacity addition planning. The draft Power Outlook 2018-2040 was presented in the E-Power Mo campaign held in Iloilo City last 09 October 2018.

3. Lead in the Plant Performance Assessment/Benchmarking of Power Generation Facilities

On 03 May 2017, the DOE promulgated the Department Circular (DC) No. 2017-05-0008 titled "Providing for the Policies and Guidelines on the Conduct of Performance Assessment and Audit for All Power Generation, Transmission and Distribution Systems and Facilities." The DC provides the policy for the conduct of performance assessment and audit (PAA) of all facilities related to the power system – power generation, transmission, and distribution systems and facilities. In support of this issuance, DC2017-12-0016 titled, "Adopting the Guidelines for the Performance Assessment and Audit of All Power Generation, Transmission and Distribution Systems and Facilities" was then issued on 28 December 2017, embodying the implementing guidelines of all PAA activities of the DOE.

These Circulars are enforced to serve as effective guideposts to evaluate the overall performance and efficiency of power facilities with respect to their mandated operational standards. In addition, these policies are also aimed at identifying existing gaps and challenges in the policies and regulations in the electric power industry, as well as the necessary action plans that are instrumental for the review and development of corrective policy measures.

In the last quarter of 2018, the DOE's Performance Assessment and Audit Team on Power Generation Facilities (PAAT-PGF) spearheaded the conduct of PAA in the following grid-connected power generation facilities listed in *Table 30*.

Table 30. LIST OF COMPLETED PAA ACTIVITIES ON GRID-CONNECTED POWER GENERATION FACILITIES

Grid	Facility	Date of PAA
Luzon	Tiwi Geothermal Power Plant	21 November 2018
Visayas	Bohol Diesel-fired Power Plant	13-14 November 2018
	Janopol Mini-Hydroelectric Power Plant	13-14 November 2018
Mindanao	Therma South Inc. (TSI) Coal-fired Power Plant	16-17 October 2018

Likewise, the DOE is firming up the engagement of professional consultants to strengthen the sustainability, institutional capacity and the overall improvement of the program. In line with this, the DOE has completed the procurement process for the Consultancy Services that is responsible for enhancing the PAA implementing guidelines, including the accreditation of the third-party independent auditors.

4. Periodic Monitoring of Power Generation Projects

As part of its regular function, the DOE closely monitors the development phase of power generation projects that are currently in the pipeline to ensure that these capacity additions are timely commissioned based on their scheduled commercial operations.

In 2018, new generating capacities totaling 934 MW were commissioned during the period as enumerated in *Table 31.* Of the total capacity, 720 MW were coal-fired, while 87 MW were oil-based plants. On the other hand, capacity additions from RE-based generation facilities reached 126 MW, comprised of 80 MW hydropower, 34 MW biomass and 12 MW geothermal. About 71.0 percent of these newly installed capacities are located in Luzon, and the remaining in Mindanao. Meanwhile, Visayas maintained a stable power supply despite no additional capacities that came online in the region.

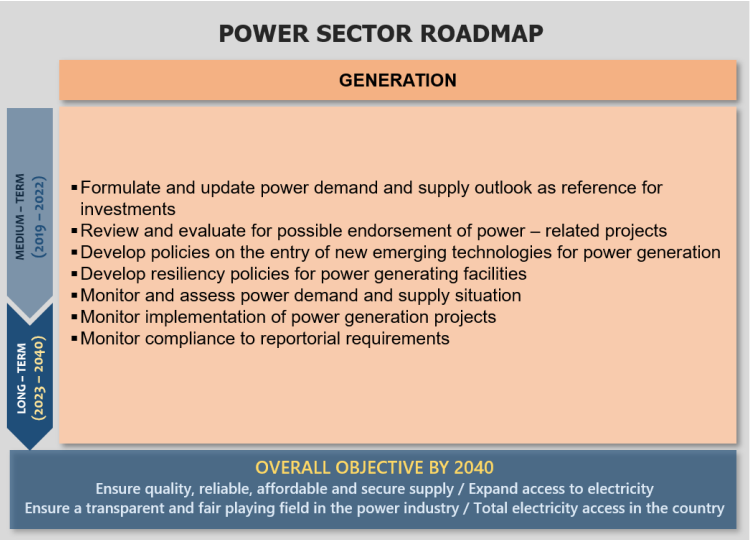
Table 31. LIST OF NEWLY COMMISSIONED POWER PLANTS in 2018 (On-Grid)

Facility	Operator	Location	Capacity (MW)	
			Installed	Dependable
LUZON			**659.90**	**636.40**
Coal			**570.00**	**555.00**
Pagbilao Unit 3	Pagbilao Energy Corporation (PEC)	Pagbilao, Quezon	420.00	420.00
SCPC Unit 3	SMC Consolidated Power Corporation (SCPC)	Limay, Bataan	150.00	135.00
Oil-based			**50.00**	**46.00**
SLPGC Unit 3	Southwest Luzon Power Generation Corporation (SLPGC)	Calaca, Batangas	25.00	23.00
SLPGC Unit 4	SLPGC	Calaca, Batangas	25.00	23.00
Geothermal			**12.00**	**12.00**
Maibarara Unit 2	Maibarara Geothermal Inc.	Sto. Tomas, Batangas	12.00	12.00
Hydropower			**8.50**	**8.00**
Maris 1 Main Canal	SN Aboitiz Power Magat, Inc.	Ramon, Isabela	8.50	8.00
Biomass			**19.00**	**15.40**
ACNC	Asian Carbon Neutral Power Corporation	Tarlac City, Tarlac	2.00	0.60
BBEC	Bicol Biomass Energy Corporation (BBEC)	Pili, Camarines Sur	5.00	4.00
SJCI Power Phase II	San Jose City I Power Corporation	San Jose City, Nueva Ecija	12.00	10.80
MINDANAO			**274.10**	**255.00**
Coal			**150.00**	**135.0**
SMC Malita Unit 2	San Miguel Consolidated Power Corporation	Malita, Davao Occidental	150.00	135.00
Diesel			**37.30**	**34.70**
KEGI-Jimenez	King Energy Generation Incorporated (KEGI)	Brgy. San Isidro, Jimenez	7.80	7.50
PBI	Peak Power Bukidnon Inc. (PBI)	Bukidnon	10.40	10.40
PSFI 2	Peak Power San Francisco (PSFI)	San Francisco, Agusan del Sur	5.20	5.20
PSI 2	Peak Power Soccsargen (PSI)	General Santos City	13.90	13.90
Hydropower			**71.80**	**71.80**
New Bataan HEPP	Euro Hydro Power (Asia) Holdings, Incorporated	New Bataan, Compostela Valley	3.00	3.00
Manolo Fortich Unit 1	Hedcor Bukidnon, Incorporated	Santiago, Bukidnon	43.40	43.40
Manolo Fortich Unit 2	Hedcor Bukidnon, Incorporated	Santiago, Bukidnon	25.40	25.40
Biomass			**15.00**	**13.50**
Lamsan Power Corporation	Lamsan Power Corporation	Maguindanao	15.00	13.50
Total			**933.60**	**880.60**

PLANS AND PROGRAMS

Mindful of its crucial role in powering the nation, the DOE is poised to buckle up concrete strategies under the generation roadmap for greater power supply security, grid stability, and increase sustainability in the long-run. In pursuit of this goal, the DOE continues to bring forth suitable policy regulations coupled with pragmatic mechanisms to promote full competition and increase transparency in the power sector (*Figure 54*).

Figure 54. POWER GENERATION ROADMAP



1. *Formulate and Update Power Demand and Supply Outlook as Reference for Investments*

To upkeep the DOE's societal contributions toward national development, the formulation and periodic updating of the country's power demand and supply outlook remains as a priority program. In carrying out this mandate, the DOE stays vigilant in developing its electricity projections giving due consideration on optimal power mix, technology neutral approach, and fuel diversity.

Apart from serving as a guidepost for economic planners, the power outlook serves as a firm reference for enticing more investments in the electric power industry, and as a responsive measure to meet the dynamic needs of surging economy. The positioning of landmark policies and regulations aimed at revamping the rigid business processes and transaction-making in the government are seen to revitalize the private sector's investment interest with a big appetite for the energy sector. These remarkably flag a turning point to attract more investors and infuse the much-needed capital, particularly in the power generation business.

2. *Monitor implementation of power generation projects*

To support the power outlook, the DOE constantly monitors the committed and indicative power projects to facilitate its timely completion to fill up the requirement of the grid. As of 31 December 2018, a total of 45 committed power projects with corresponding total installed capacity[77] of 6,329 MW were listed in the private sector initiated power projects of DOE. On a per grid basis, the committed power projects in Luzon have an aggregated installed capacity of 4,775 MW, Visayas with 766 MW, and Mindanao with 788 MW as shown in *Figure 55* and *Table 32*.

[77] Installed capacity is the rated or nameplate capacity of the power plan

Among fuel sources, capacity from conventional power plant type (coal, oil-based and natural gas) totals 5,813 MW, constituting more than 90.0 percent of the installed capacity. Meanwhile, renewable energy sources (geothermal, hydro, solar, wind, and biomass) make up a little less than 10.0 percent of the total capacity, or 516 MW.

Figure 55. COMMITTED POWER PROJECTS (As of 31 December 2018)

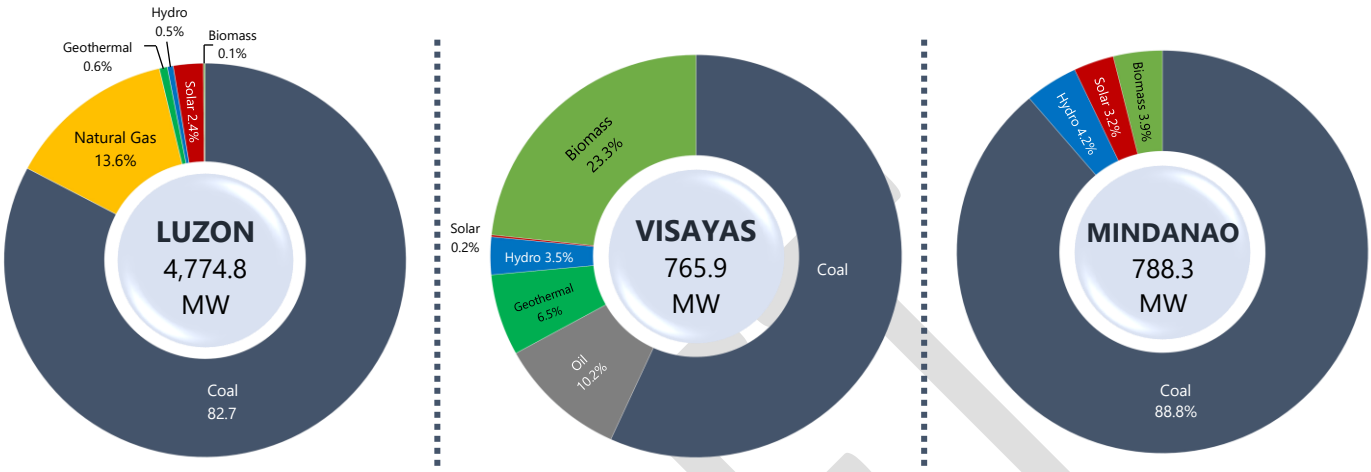


Table 32. SUMMARY OF COMMITTED POWER PROJECTS (As of 31 December 2018)

Plant Type	Luzon		Visayas		Mindanao		Philippines	
	No. of Projects	Rated Capacity (MW)	No. of Projects	Rated Capacity (MW)	No. of Projects	Rated Capacity (MW)	No. of Projects	Rated Capacity (MW)
Coal	6	3,950.0	2	435.0	2	700.0	10	5,085.0
Oil-based	-	-	2	78.0	-	-	2	78.0
Natural Gas	1	650.0	-	-	-	-	1	650.0
Geothermal	1	31.0	1	50.0	-	-	2	81.0
Hydropower	8	22.6	2	23.1	2	33.0	12	78.7
Solar	1	115.0	3	1.2	1	25.0	5	141.2
Wind	-	0.0	-	-	-	-	-	-
Biomass	2	6.2	6	178.6	5	30.4	13	215.1
Total	**19**	**4,774.8**	**16**	**765.9**	**10**	**788.3**	**43**	**6,329.0**

In the same reference period, the DOE is tightly monitoring 291 indicative power projects with a total capacity equivalent to 33,199 MW. Of the total, 26,805 MW are lined up in Luzon, 3,903 MW in Visayas and 2,491 MW in Mindanao *(Figure 56).*

Figure 56. INDICATIVE POWER PROJECTS (As of 31 December 2018)

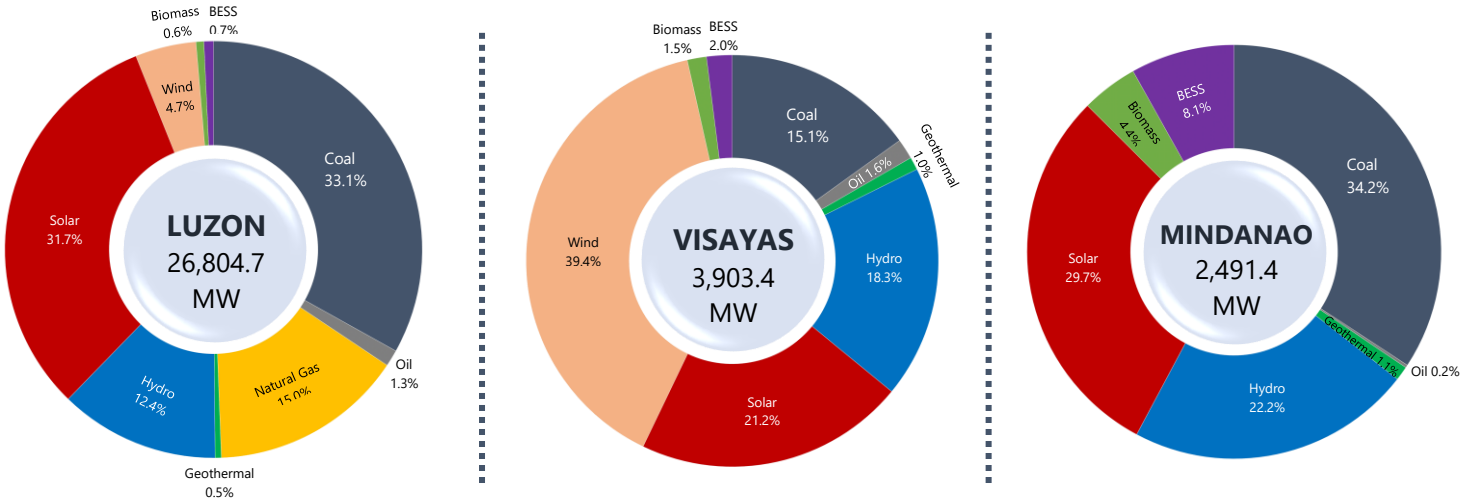


Table 33. SUMMARY OF INDICATIVE POWER PROJECTS BY ISLAND GRID (As of 31 December 2018)

Plant Type	Luzon		Visayas		Mindanao		Philippines	
	No. of Projects	Rated Capacity (MW)	No. of Projects	Rated Capacity (MW)	No. of Projects	Rated Capacity (MW)	No. of Projects	Rated Capacity (MW)
Coal	12	8,935.0	2	600.0	3	928.0	17	10,463.0
Oil-based	3	346.0	4	63.5	1	5.9	8	415.4
Natural Gas	5	4,060.0	-	-	-	-	5	4,060.0
Geothermal	3	130.0	1	40.0	1	30.0	5	200.0
Hydropower	62	3,344.2	19	728.2	19	603.2	100	4,675.6
Solar	59	8,550.0	15	843.7	20	805.0	94	10,198.6
Wind	11	1,275.4	13	1,568.0	-	-	24	2,843.4
Biomass	14	164.0	5	60.0	8	119.4	27	343.4
BESS	8	200.0	4	80.0	2	220.0	14	500.0
Total	**177**	**26,804.7**	**63**	**3,903.4**	**54**	**2,491.4**	**294**	**33,199.5**

By fuel type, RE-based generation facilities sum up at 18,261 MW, accounting for 55.0 percent of the total indicative capacity, mostly from solar *(Table 33)*. On the other hand, fossil-based fuels, composed of coal and natural gas, represent 31.5 percent and 12.2 percent shares, respectively. Meanwhile, 14 projects using battery energy storage system (BESS) are also included in the indicative projects with an aggregate capacity of 500 MW. *The detailed list of the committed and indicative power projects as of 31 December 2018 can be found in Annex __.*

3. Review and Evaluate for Possible Endorsements of Power-related Projects

Considering the positive economic outlook of the country, the DOE deems it vital to have adequate and sufficient capacity additions across the grids. To realize this, the DOE stringently reviews, evaluates and endorses power-related projects with due diligence consistent with existing policies and regulatory framework. In conjunction, the DOE continually processes and issues pertinent clearances and endorsements, and oversees project implementation to ensure the timely completion and commercial operations of the power generation projects.

4. Develop Policies on the Entry of New Emerging Technologies for Power Generation

The policy direction of the DOE on fuel source diversity aims to address the reliance of the power sector to a particular fuel source towards electricity supply security. In parallel with this thrust, the

DOE is set to pursue the formulation of enabling policies to push for the strategic pacing and mainstreaming of advanced and emerging technologies for power generation, such as ocean thermal energy conversion (OTEC), fuel cells, nuclear energy, and energy storage system (ESS), among others.

To initiate the development of the policy framework on the adoption of ESS in the country, the DOE steered several FGDs and consultations nationwide among energy agencies, electric power industry participants, and stakeholders. Inputs for the said FGDs and Public Consultations form part of the DC No. 2019-08-0012 entitled *"Providing a Framework for Energy Storage System in the Electric Power Industry"*, which was signed on 1 August 2019. The implementation of the DC is timely for the medium- to long-term targets of the roadmap.

Another technology that the DOE monitors is the development of Liquefied Natural Gas (LNG) in the power sector. In 2017, the DOE issued a policy for the Philippine Downstream Natural Gas Regulation (PDNGR) which aims to expedite the entry of LNG to the country in time for the depletion of the Malampaya Natural Gas reservoir.

Meanwhile, initiatives for the development of administrative policies on other emerging technologies for power generation is already underway and remains as a continuing target of the roadmap within the planning period.

5. Develop Resiliency Policies for Power Generating Facilities

Ensuing the promulgation of the universal framework for Energy Resiliency Policy, the DOE also focuses on developing the governing policies to reinforce the resiliency of power generation facilities. The policy broadly grasps operational protocols and contingency measures to make power facilities withstand from all forms of natural and human-induced calamities and immediately restore the electricity service.

Said policy is primarily aimed at mitigating and adapting to adverse impacts of climate change and strengthen safety and dependability of the power system of the country. It is seen as an imperative strategy for continuous delivery of power services amidst uncontrollable disruptive events.

6. Monitor and Assess Power Demand and Supply Situation

In the performance of its regular function, the DOE constantly monitors and assesses power demand and supply situation, which is imperative for conveying timely, strategic, and proactive measures for the sector. Learning from previous experiences, the DOE ardently executes full authority over mandated industry participants to ensure quality, reliability, affordability and security of supply of electric power across the country.

7. Monitor Compliance to Reportorial Requirements

The DOE upholds its supervisory role to all electric power industry participants, including energy stakeholders, by monitoring their compliance to reportorial requirements set forth by existing laws policies and regulations of the government. These reports serve as decisive platform and effective tool to strengthen and improve the DOE's planning and policy making functions.

C. TRANSMISSION

The Transmission Development Roadmap is a clear and comprehensive pathway that directly supports the national goal of achieving reliability and integrity of the country's transmission grid. This roadmap assessment highlights the implementation of the commitments set forth in the short-term (2017-2018) linked to realizing the target goals for medium- to long-term.

ASSESSMENT

1. Timely Completion of Transmission Projects

With the growing load and steadily increasing demand, the timely completion and commissioning of transmission infrastructures remain high in the DOE's agenda in pursuit of decongesting the existing transmission facilities and enabling the connection of new power projects to the grid allowing greater market competition.

For the short-term assessment, the NGCP focused on upgrading substation capacities and expanding transmission backbones to support entry of new generating facilities. From 2017 to 2018, the NGCP completed a total of 552.24 circuit-kilometer (ckt-km) of overhead transmission lines, installed 851 megavolt amperes (MVA) additional substation capacities, and added 35 megavolt amperes reactive (MVAR) or reactive power for voltage improvement (*Table 34*).

To ensure timely completion of the planned projects, the DOE endorsed a total of 48 transmission projects of the NGCP as *"Energy Projects of National Significance."* To date, all these projects have already been issued with CEPNS by the EICC, and thus, entitled to all the rights and privileges under EO30. (*Please see Annex _ for the List of Projects with CEPNS*). With priority status, expeditious implementation and development of transmission projects is expected.

Table 34. LIST OF COMPLETED PROJECTS, 2017-2018

Project Name / Components	Purpose	MVA	MVAR	CKT-KM	Date of Completion / Energization
LUZON					
Luzon S/S Expansion Project 4 - Daraga S/S - Gamu S/S (transferred from Santiago S/S)	To add substation capacity to accommodate load growth.	100 50	-	-	May 2017 Jul 2017
Las Piñas S/S Expansion Project	To add capacity and provide N-1 security to adequately and reliably meet the increasing load in Metro Manila.	300	-	-	Jun 2017
Santiago–Tuguegarao 230kV T/L	To provide N-1 contingency for the existing transmission corridor serving Isabela and Cagayan.	-	-	118	Sep 2017
Luzon Voltage Improvement Project 3 - Laoag S/S	To maintain the voltage profile at various substations within the prescribed limits.	-	35	-	Sep 2017
Eastern Albay 69 kV T/L, Stage 1 - Daraga–Sto. Domingo T/L - Daraga S/S - Sto. Domingo LES	To provide a more reliable transmission corridor in the eastern coast of Albay	10	-	21	Dec 2017 Dec 2017 Dec 2017

Bataan 230 kV Reinforcement - Reconductoring of Mexico–Hermosa T/L & Mexico–Cabanatuan "Cut in" Cruz na Daan Line 1 & 2 - Reconductoring of Hermosa–Limay T/L Line 1 & 2	To accommodate the connection of the committed 300 MW SMC CPC CFPP project to the Luzon Grid	-	-	36 38	Mar 2018 Jun 2018
Luzon Substation Reliability 1 - Labo S/S	To add substation capacity that will provide N-1 contingency	50	-	-	Jun 2018
VISAYAS					
Culasi–San Jose 69 kV T/L Schedule 2A & 2B	To provide N-1 contingency for the existing corridor.	-	-	31.5	Jan 2017
Visayas S/S Reliability Project 1 - Samboan S/S - Bacolod S/S	To provide N-1 contingency transformers at various Substations.	50 100	-	-	Mar 2017 Apr 2017
Upgrading of Panitan-Nabas 138 kV T/L	To address system limitation and improve the reliability of the Panitan-Nabas 139 kV Transmission Line.	-	-	-	Mar 2017
Upgrading of Ormoc/Tongonan-Isabel 138kV T/L (Typhoon Yolanda) - Ormoc–Isabel Line 1 - Tongonan–Isabel Line 1 - Tongonan–Isabel Line 2	To address system limitation and improve the reliability of the Ormoc/Tongonan- Isabel 138 kV Transmission Line.	-	-	-	 May 2017 Jul 2017 Sep 2017
Visayas S/S Reliability Project 1 - Amlan S/S	To provide N-1 contingency transformers at various substations.	50	-	-	Dec 2017
Eastern Panay Transmission Line Project - Concepcion–Barotac Viejo 138 kV T/L 1 - Concepcion–Tapping pt. near Sara 69 kV OHTL	To provide a more reliable transmission service to Eastern Panay and accommodate entry of PCPC's 270 MW CFPP.	-	-	42 14.2	Nov 2017 Sept 2018
Ormoc–Babatngon 138 kV Transmission Line - Ormoc–Babatngon T/L - Ormoc Substation Exp. - Babatngon Substation Exp.	To provide N-1 contingency for the existing corridor by installing a second circuit.	-	-	78.54	8 Dec 2018
MINDANAO					
Aurora–Polanco 138 kV T/L - Aurora–Polanco T/L Line 1 **Line 2** - Aurora Substation Exp. - Polanco S/S (New)	To serve the growing demand of Dipolog City and neighboring load centers as well as ensure continuous and reliable power supply in the Zamboanga Del Norte area.	75	-	158	 20 Jun 2018 22 Jul 2018 20 Jun 2018 20 Jun 2018
Manolo Fortich Switchyard 138 kV Switchyard Project - HBI Hydro Power Plant – Manolo Fortich Switchyard T/L - Manolo Fortich S/S	To enable the full capacity dispatch of the 68.8 MW Manolo Fortich Hydroelectric Power Plant	66	-	15	28 May 2018
Agus 6 Switchyard Upgrading / Rehabilitation Project	To upgrade the existing obsolete and aging primary and secondary equipment and devices in Agus 6 Switchyard	-	-	-	31 Oct 2018
Total		**851**	**35**	**552.24**	

Source: NGCP

In addition, the DOE also endorsed to the National Commission on Indigenous People (NCIP) for the issuance of a Certification Precondition/Certificate of Non-Overlap (CO/CNO) for the following major transmission projects:

- Mindanao-Visayas Interconnection Project;
- Nabas-Caticlan-Boracay Transmission Project;
- Cebu-Negros-Panay 230 KV Backbone Project (Stage 3); and,
- Tiwi Substation Upgrading Project.

2. *Power Plants Siting*

As part of continuous enhancement in the formulation of Transmission Development Plan (TDP), the NGCP has included in the Plan the ideal locations of power plants to maximize the capability of the existing network and to serve as a guide for investors in power generation (*Figures 57, 58, 59*). The recommended connection points are the areas with existing substations that can still accommodate additional connection of new power plants without the need for any transmission reinforcement. Future siting of power plants reduces the need for major transmission reinforcement to address congestion, as well as to cater bulk generation capacity addition.

Figure 57. IDEAL LOCATION OF POWER PLANTS, Luzon

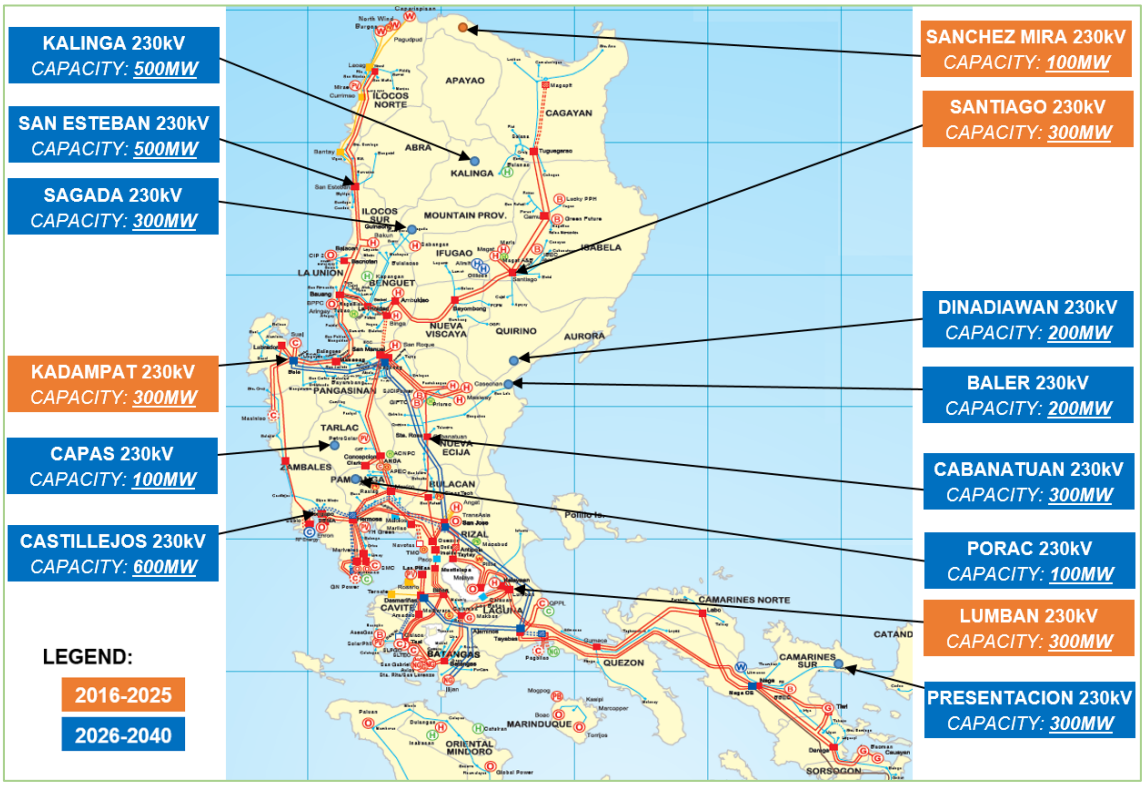


Figure 58. IDEAL LOCATION OF POWER PLANTS, Visayas

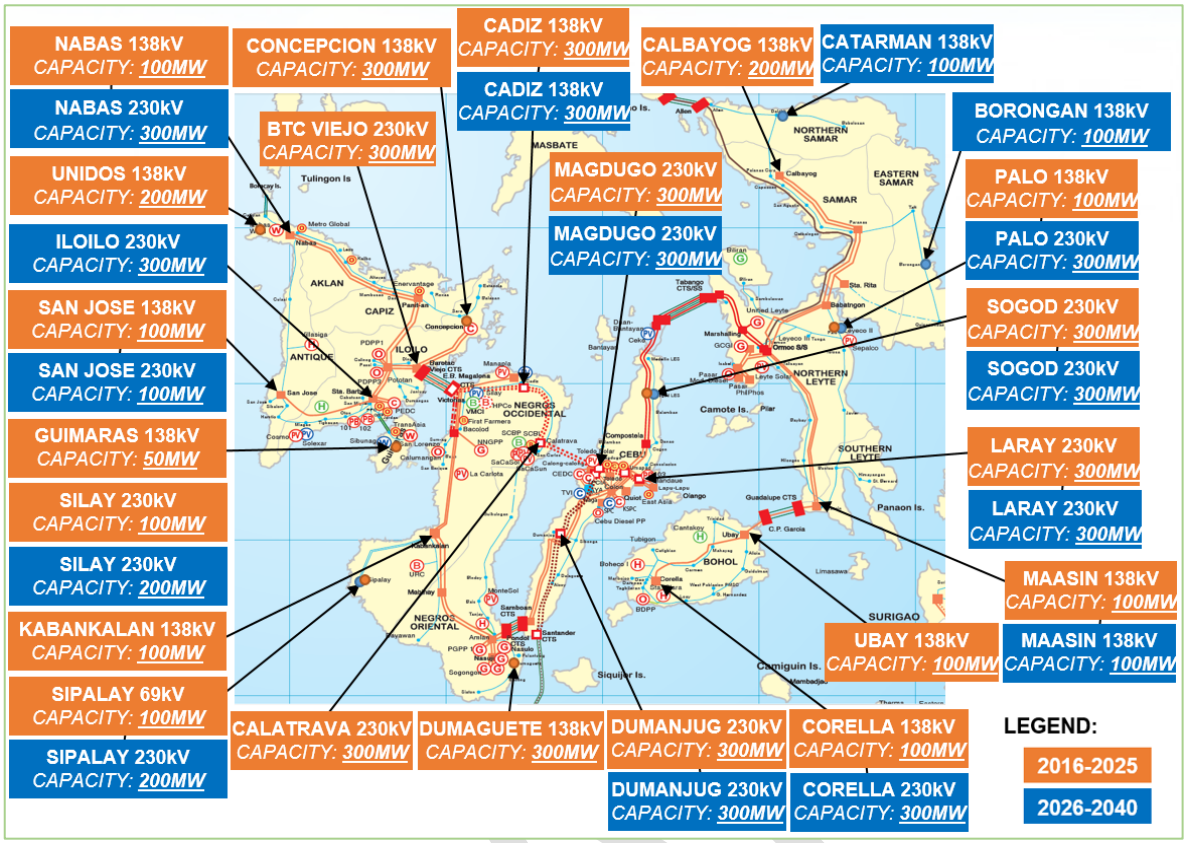
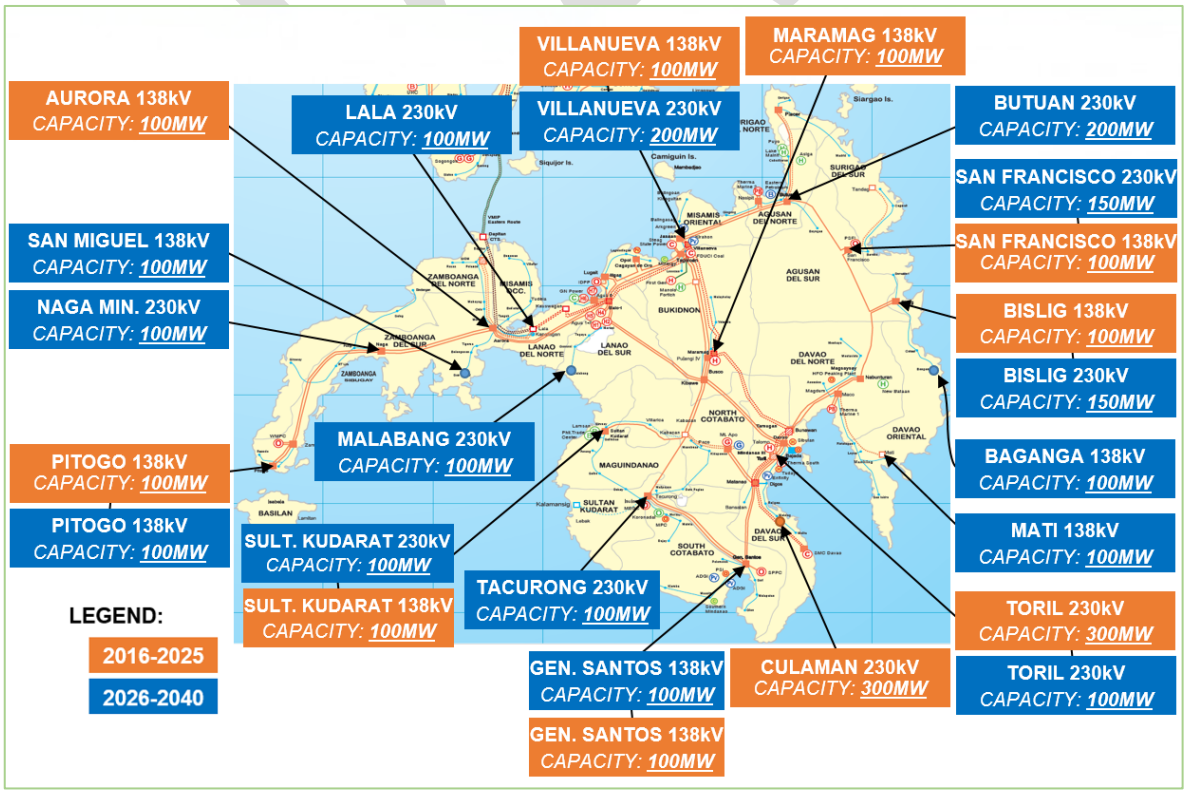


Figure 59. IDEAL LOCATION OF POWER PLANTS, Mindanao



3. *Interconnect Major Grids*

For the short-term, the DOE is committed to facilitate the interconnection of the three (3) major grids (Luzon, Visayas, and Mindanao) to ultimately achieve the longstanding goal of a unified national grid. Hence, the project with the highest priority among other interconnection projects is the Mindanao - Visayas Interconnection Project (MVIP).

Considered as one of the biggest power infrastructure projects, the implementation of MVIP is in the close watch of the DOE. In July 2017, the NGCP was granted by the ERC the provisional authority to implement the project. In May 2018, the project qualified as an EPNS and was issued with CEPNS by the EICC. With this, the issuance of regulatory and documentary requirements by the different local and national government agencies will be expedited to meet the target completion date of December 2020.

4. *Monitor Compliance with Transmission Development Plan*

As part of its continuing activities, the DOE is closely monitoring the implementation of projects identified in Transmission Development Plan 2016-2040. The projects are mainly consisting of continuous upgrading, rehabilitation, and expansion of existing transmission lines, substations and other related facilities. Currently, one of the monitoring mechanisms is through the NGCP's submission of monthly status report of transmission projects that indicates the progress of various project items including securing permits and clearances.

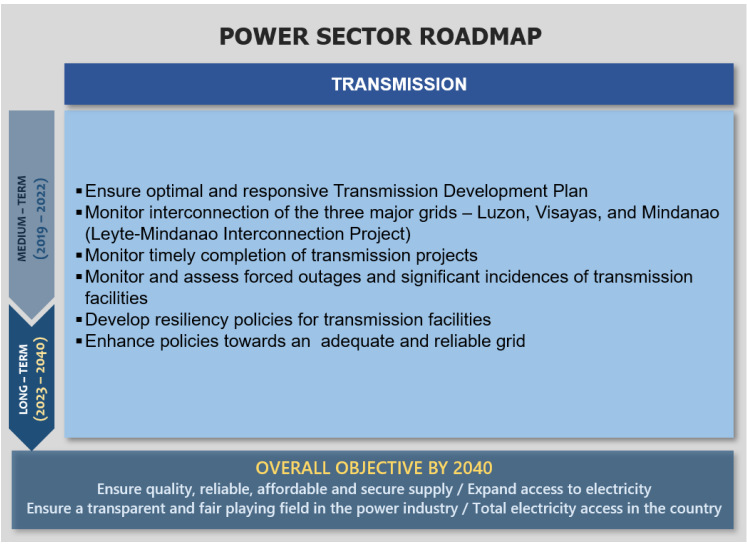
5. *Resiliency Planning*

With the introduction of the Resiliency Policy by the DOE, one of the key highlights of TDP is the planning considerations for resiliency to improve the ability of the power system to withstand the effects of adverse environmental conditions, man-made power interruptions, and other system disturbances. To make the transmission system resilient, the NGCP included in its resiliency planning the enhancement of transmission line and substation site selection, increase of transmission towers strength and capacity, and security of transmission assets.

PLANS AND PROGRAMS

To fulfill the vision of a strong, unified electricity transmission network that can meet the country's increasing power needs until 2040, the DOE warrants the formulation of a responsive Transmission Development Plan through NGCP giving due importance on continuous transmission system upgrades and expansion, generation siting with no reinforcement requirement, island interconnections, and building necessary transmission infrastructures to enable the connection of renewable energy plants.

Figure 60. POWER GENERATION ROADMAP



It is critical that appropriate transmission projects are developed and commissioned on time to reliably and efficiently deliver electricity to the consumers. Responding to the need to upgrade and expand the existing transmission system, the DOE continues its initiative to monitor and facilitate the timely completion of transmission projects in reference to the Transmission Development Plan 2019-2040, a 22-year roadmap for the expansion of the Philippine power grid. As shown in *Table* 35 and *Figure 61*, part of the priority projects is the development of new transmission backbones and island interconnections that are geared towards the DOE and NGCP's vision to build the strongest power grid in Southeast Asia and improving the country's transmission network consistent with the long-term Transmission Master Plan (TMP).

Figure 61. TRANSMISSION BACKBONES AND ISLAND INTERCONNECTIONS

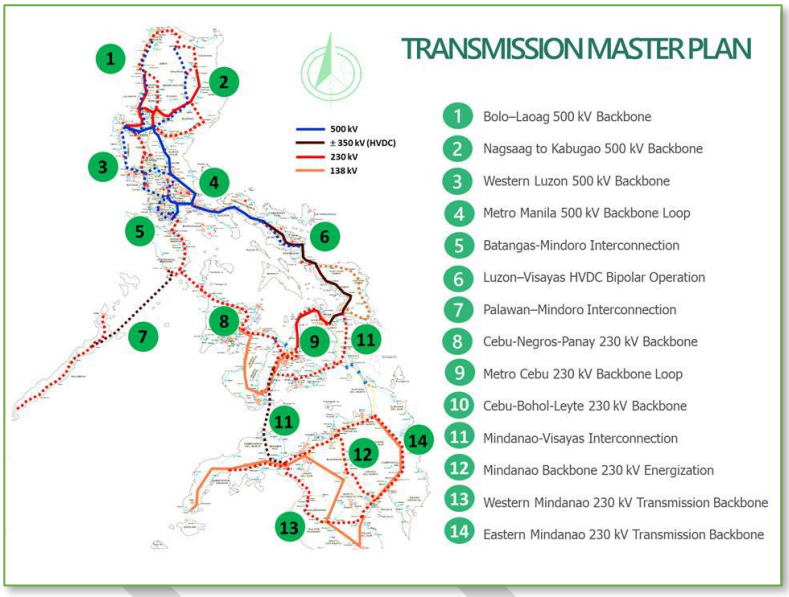


Table 35. TMP PROPOSED PROJECTS, 2019-2040

Project Name	Provinces	Expected Time of Completion
Luzon		
Metro Manila 500 kV Backbone Loop	Taguig	Sept 2021
Bolo to Laoag 500kV Backbone	Ilocos Sur, La Union, Pangasinan	Dec 2024
Batangas-Mindoro Interconnection Project	Batangas, Oriental Mindoro, and Occidental Mindoro	Dec 2024
Palawan-Mindoro Interconnection Project	Mindoro and Palawan	Dec 2024
Western Luzon 500 kV Backbone	Pangasinan, Zambales	Jun 2025
Luzon-Visayas HVDC Bipolar Operation	Camarines Sur and Leyte	Dec 2030
Nagsaag to Kabugao 500kV Backbone	Isabela, Pangsinan, and Apayao	Dec 2035
Visayas		
Cebu-Negros-Panay 230 kV Backbone	Cebu, Negros Occidental, Iloilo	Dec 2020
Cebu-Bohol-Leyte 230 kV Backbone	Cebu, Bohol, and Leyte	Dec 2035
Metro Cebu 230kV Backbone Loop	Cebu	Dec 2040
Mindanao		
Mindanao 230 kV Backbone	Mindanao Island	Mar 2019
Mindanao-Visayas Interconnection Project	Cebu, Lanao del Norte, Zamboanga del Norte	Dec 2020
Eastern Mindanao 230 kV Transmission Backbone	Agusan Del Norte, Agusan Del Sur, Compostella Valley	Jan 2025
Western Mindanao 230 kV Transmission Backbone	Zamboanga del Sur, Sultan Kudarat, Maguindanao, South Cotobato	Dec 2040

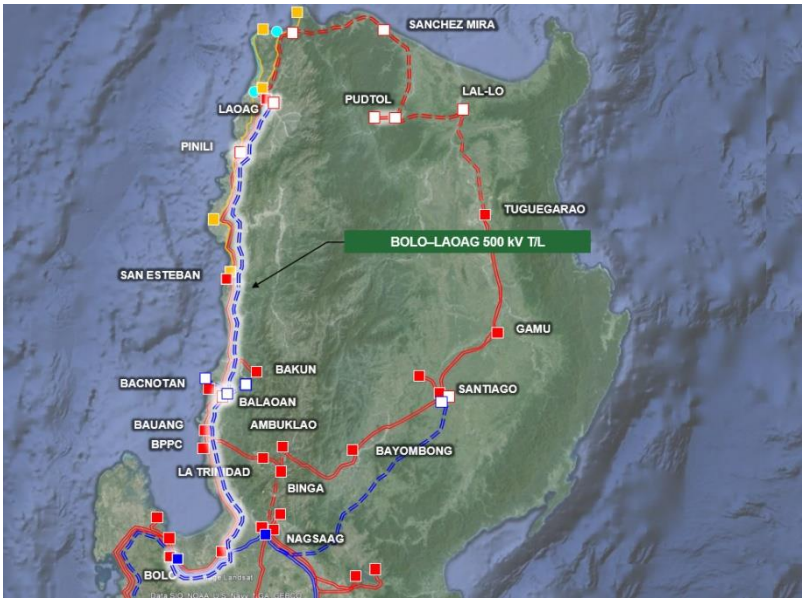
Since some of the segments of these huge and complicated backbone projects included in the TMP are still subject for detailed studies, the DOE focuses more attention to the following significant projects programmed for completion up to 2025 and considered crucial in the development of the grid:

1. Metro Manila 500 kV Backbone Loop

The only Extra High Voltage (EHV) drawdown facilities servicing Metro Manila are the two existing 500 kV substations located in San Jose del Monte City, Bulacan and Dasmariñas, Cavite. These become critical nodes in the grid as capacity expansion and space limitations in these substations could result in grid congestion. For a more efficient power network, part of the proposed long-term expansion plan for Metro Manila is the development of the new 500 kV substations, such as the Taguig EHV Substation. Taguig City is considered as the priority site due to its proximity to the load center. The development of Taguig EHV Substation including its associated 500 kV Lines will support the load growth and strengthen the grid by forming loop configurations. Aside from Taguig EHV Substation, major 500/230 kV drawdown substations will be developed around the area – the Marilao 500 kV Substation and Silang 500 kV Substation including its associated 500 kV lines *(Figure 62).*

Figure 62. METRO MANILA TRANSMISSION OUTLOOK

Figure 63. BOLO TO LAOAG 500 KV



2. Bolo to Laoag 500 kV Backbone

The development of Bolo to Laoag 500 kV Transmission Line addresses the entry of the proposed coal, hydro, and wind power generating plants in the north eastern part of the grid (*Figure 63).* The backbone development is consists of two projects: (1) Bolo–Balaoan 500 kV Transmission Line to support the entry of large generation capacity, such as the 4x335 MW Luna Coal Plant in La Union, and the 500 MW Pumped- Storage Hydro Power Plant in Benguet; and (2) Balaoan–Laoag 500 kV Transmission Line to accommodate the additional wind farm project in Ilocos Area and address the overloading of the San Esteban–Laoag 230 kV Line during N-1 contingency.

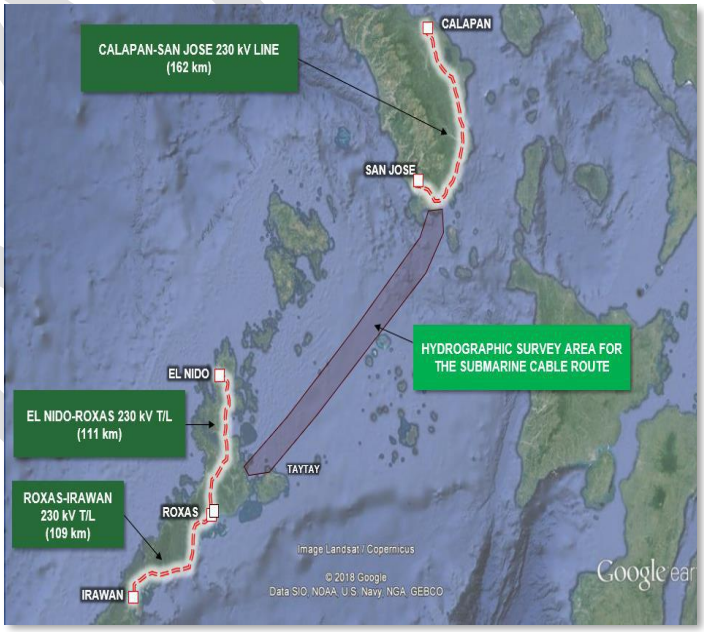
3. Batangas-Mindoro Interconnection Project (BMIP)

Figure 64. CONNECTION CONFIGURATION OF BMIP

The project intends to develop a 230 kV interconnection via submarine cable between the island of Mindoro and main Luzon grid. This allows the island to have access on bulk generation sources in the main grid, while at the same time, export possible excess power once the generation potentials within the island have been developed. Based on the conducted transmission line route investigation, the nearest connection substation is the proposed Pinamukan 500 kV Substation in Batangas. The expected improvement in supply reliability can result in better economic growth as the island could attract more investors for industrial and commercial loads, and for the tourism industry *(Figure 64)*.

4. Palawan-Mindoro Interconnection Project (PMIP)

Figure 65. CONNECTION CONFIGURATION OF PMIP



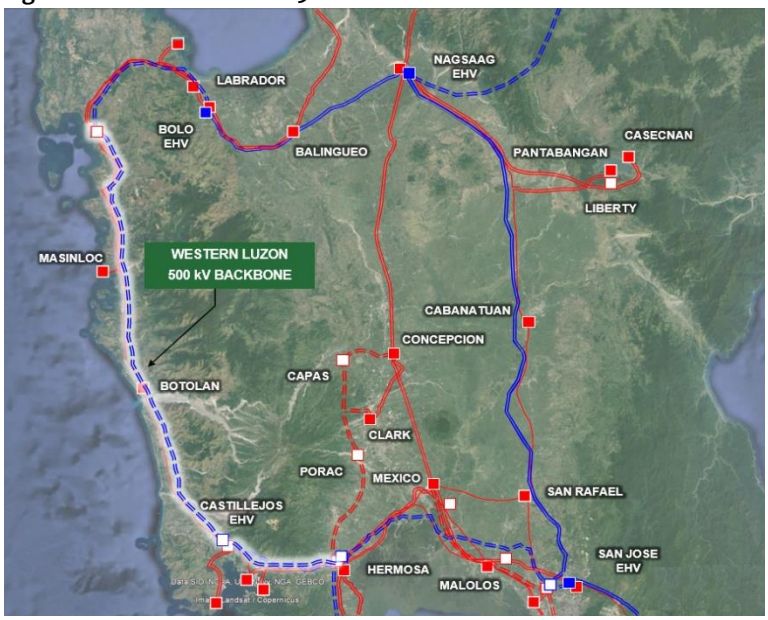
The envisioned Batangas-Mindoro Interconnection Project gives rise to the proposed interconnection of Palawan to the Luzon Grid through the Mindoro Grid. The Palawan Mindoro Interconnection Project (PMIP) aims to provide the Mainland Palawan a more reliable supply of power and to address the power quality issues, which result in frequent blackouts experienced by the customers. The project development will be implemented in a stage-by-stage basis. Stage 1 covers the conduct of detailed studies to determine the submarine cable route as well as the preparation of the Mindoro Backbone through the development of Calapan–San Jose 230 kV Transmission Line Backbone and San Jose 230 kV Substation in Occidental Mindoro. Stage 2 involves the physical implementation of the PMIP *(Figure 65)*.

5. Western Luzon 500 kV Backbone

The first stage of this grid expansion project is the construction of Castillejos-Hermosa 500 kV Transmission Line to accommodate the bulk generation in Zambales, such as the 2X300 MW RP Energy Coal-Fired Power Plant. The new line will be initially energized at 230 kV voltage level and will form part of the proposed long-term plan for 500 kV backbone loop development from Bolo

(Kadampat) down to Hermosa Substation. The second stage will complete the reinforcement of the capacity of the western corridor presently consisting of a single-circuit line from Labrador down to Botolan to Hanjin then to Olongapo which involves the construction of a new Castillejos Substation, Bolo Substation, and the Castillejos-Bolo 500kV transmission line, creating the Bolo–Castillejos–Hermosa 500 kV transmission line backbone in Western Luzon (*Figure 66*). The long-term development plan considers providing higher level of reliability up to N-2 contingency for the 500 kV backbone system of the Luzon grid.

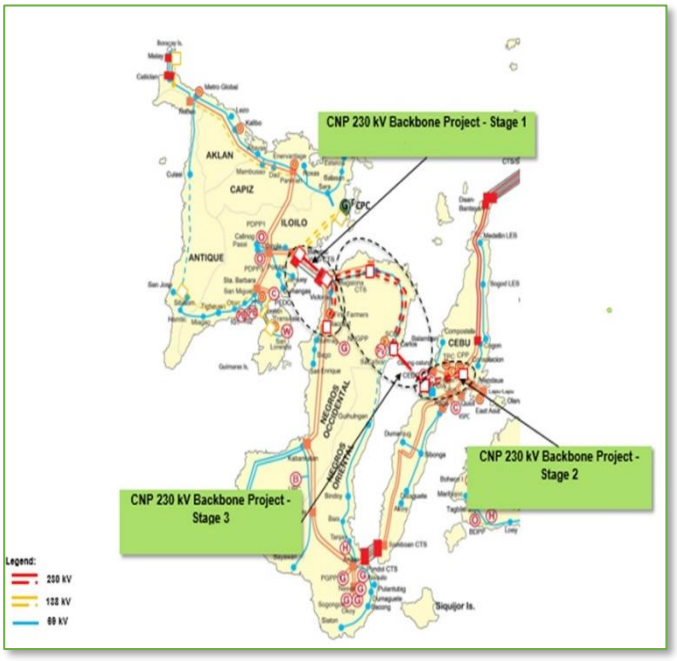
Figure 66. WESTERN LUZON 500 KV BACKBONE



6. *Cebu-Negros-Panay 230 kV Backbone*

The development of 230 kV transmission backbone from Cebu up to Panay Island is divided into three stages. The development of high capacity transmission corridor via submarine cable between Negros and Panay forms part of the first stage of the project. The submarine cable component was already energized in October 2016 addressing the congestion and market issues brought about by the limited capacity of the existing single-circuit 138 kV link (*Figure 67*).

Figure 67. CEBU-NEGROS-PANAY 230 KV BACKBONE



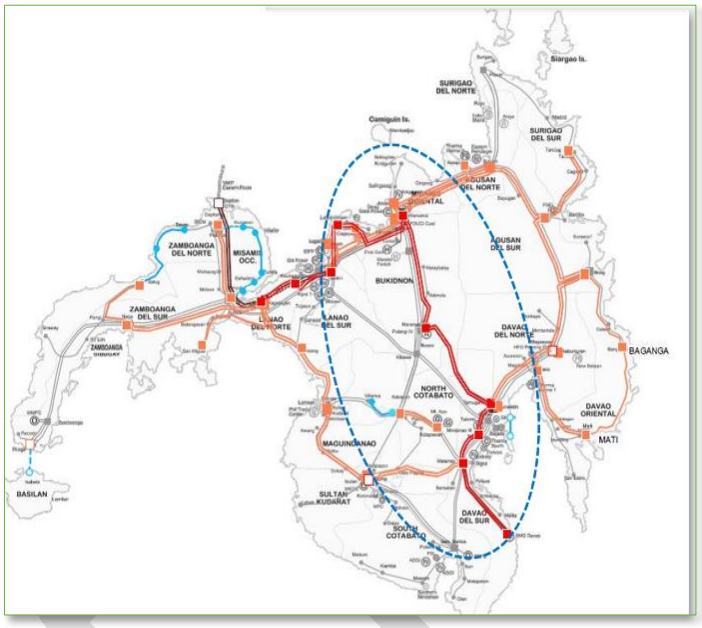
The second stage involves the construction of 230 kV facilities in the existing Cebu 138 kV Substation. It aims to facilitate the termination of the proposed overhead transmission line from the 300 MW coal-fired power plant of Therma Visayas, Inc. in Toledo City, Cebu.

To enable the sharing of power supply among the three islands, the last stage includes the development of 230 kV facilities extending from Barotac Viejo Substation in Panay to a new Magdugo Substation in Cebu. It is intended to accommodate the transmission of excess power from Panay and Negros Islands toward the rest of the Visayas grid and possibly Luzon grid.

7. Mindanao 230 kV Transmission Backbone

This backbone project aims to further strengthen the entire Mindanao grid upon the entry of new generating plants. It entails two major activities – the construction of the 230 kV Transmission Line traversing Matanao-Toril-Bunawan route, and the energization of the existing Mindanao Transmission Backbone (Balo-i-Villanueva-Maramag-Bunawan) to 230 kV voltage level. Energizing the Mindanao Backbone to 230 kV voltage level allows full dispatch of the new large power plants and eliminate the vulnerability of power supply to hydropower (*Figure 68*).

Figure 68. MINDANAO 230 KV TRANSMISSION BACKBONE



8. Mindanao-Visayas Interconnection Project (MVIP)

Formerly known as the Visayas-Mindanao Interconnection Project, the change to MVIP aims to highlight the importance and priority given to Mindanao grid, which has long been isolated. The project aims to realize a single, unified national grid by connecting the Mindanao grid to the Visayas grid. Based on the desktop study and results of the hydrographic survey, the recommended route traverses the country's western seaboard through the Zamboanga del Norte-Cebu interconnection (*Figure 69*).

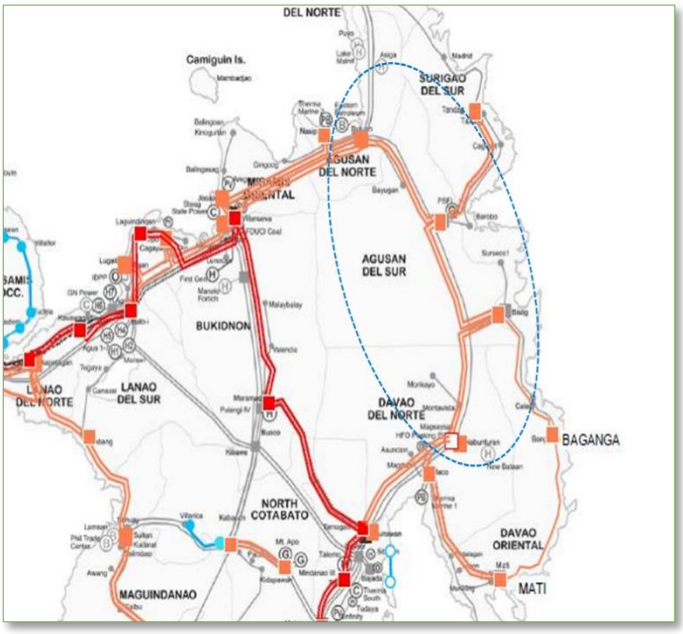
The project's potential benefits is on reduced investments in power generation due to sharing of system reserves, lesser investment in power generation in either the Visayas or Mindanao to maintain the one-day Loss of Load Probability (LOLP), and reduction of operating cost due to economic dispatch of generators. Further, it will help optimize the use of available energy resources and additional generation capacities in the country in support to the operation of the electricity market to include the Mindanao grid.

Figure 69. CONNECTION CONFIGURATION OF MVIP

9. *Eastern Mindanao 230 kV Transmission Line*

The project entails reinforcement of the existing 138 kV single circuit transmission line serving the substations of Butuan, San Francisco, Bislig and Nabunturan in eastern Mindanao, which already lacks the single outage contingency requirement as prescribed in the Philippine Grid Code. This development addresses the anticipated power quality problems caused by possible operations of huge mining loads in the area. More so, it serves as an initial step in establishing a higher transmission corridor in the north eastern Mindanao Area. The implementation of the project requires a total of 282.68 km of new 230 kV transmission lines, required power circuit breaker (PCBs) and associated equipment (*Figure 70*).

Figure 70. EASTERN MINDANAO 230 KV TRANSMISSION



The list of transmission projects identified in the TDP are summarized in Annexes _-_, detailing all ongoing and future projects including the expected completion dates.

From a number of transmission projects that are part of the TDP, the DOE embarks to keep a tight watch on the implementation of MVIP to fully realize the vision of one Philippine grid in 2020. Similarly, the interconnection of emergent island-grids to the main grid are also envisioned to be implemented by building new interconnection facilities that link the isolated islands to the main grids *(Annex _)*.

The DOE is also set to monitor and assess forced outages and significant incidences of transmission facilities to avoid major system disturbances causing power interruptions and transmission-related outages. To efficiently address the damage brought by natural and man-made disasters to transmission lines and facilities, the grid operator and the DOE will continue to disaster-proof the country's transmission network for long-term resilience through developing climate-resilient transmission infrastructures and implementing resiliency policies and programs specific for transmission subsector.

The DOE deems it necessary to continuously enhance the transmission policies to achieve the targets specified for medium- to long-term and carry out the implementation schemes in the TDP.

D. DISTRIBUTION

The DOE provides continuous support to DUs in increasing their capacities and improving the quality of service provided to their franchise areas through new policies and programs. These include the issuance of a policy on the conduct of PAA on the distribution system and facilities and the drafting of DCs directing amendments and additional guidelines on the Distribution Development Plan (DDP).

Policy on the conduct of Competitive Selection Process (CSP), framework for the uniform monthly electric bill format, and the rules governing the review and evaluation of direct connection applications were also issued in accordance with DOE's mandate in ensuring transparent and a reasonable price of electricity.

ASSESSMENT

1. *Distribution Development Plan*

To effectively implement the DC2004-02-002 titled "*Prescribing the Guidelines for the Formulation of a Five-Year Distribution Development Plan*" pursuant to Section 2 of DC2003-12-011, "*Enjoining all Distribution Utilities to Supply Adequate, Affordable, Quality and Reliable Electricity,*" the DOE drafted a DC directing amendments and providing additional guidelines to DC2004-02-002.

The draft guidelines will require DU's additional information on the existing and potential contestable customers for Retail Competition and Open Access (RCOA), available renewable resources and the number of customers with net-metering in preparation for the Renewable Portfolio Standards (RPS) and the Green Energy Option Program (GEOP). Information on the capital expenditure projects and financing requirements should also be reflected in their respective five-year DDPs. Through these provisions, the DOE will be able to closely monitor, in close coordination with ERC, the operability of all distribution facilities and the progress in project implementation.

In 2018, the DOE completed the Distribution Development Plan 2017-2026, which outlines the 10-year demand outlook and supply requirements of the DUs and their contracted supply mix. The plan highlights the annual average growth rate (AAGR) of peak demand over the 10-year planning period, as well as the main drivers of projected load growth. It also presents a comparative analysis of the estimated values for 2016 on the number of customers, energy sales and system loss from the previous DDP 2016-2025 vis-a-vis the actual 2016 data as indicated in the DDP 2017-2026.

2. *Uniform Monthly Electric Bill Framework*

To protect public interest affected by rates and services of the DUs and electricity supply providers, the DOE promulgated the Framework for the Uniform Monthly Electric Bill Format, which was published through DC2018-08-0026 on 14 September 2018. The framework provides that all entities issuing electricity bills – *Private-Investor Owned Utilities (PIOUs), Electric Cooperative (ECs), Local Government-Owned Utilities (LGOUs) and other entities authorized by law to distribute and/or supply electricity, including the Retail Electricity Suppliers* – shall use a uniform bill format. The uniform bill should reflect all corresponding charges, such as, but not limited to generation, transmission and ancillary services, distribution, supply and metering charges, universal charges and bill deposits, subject to the rules and regulations that the ERC may promulgate. In June 2018, four (4) public consultations on the draft DC were conducted in Mandaluyong City, General Santos City, Cebu City and Puerto Princesa City, Palawan.

Efforts to continuously empower electricity consumers with greater understanding on monthly electricity bill, the DOE has prepared regular statistics on electricity charges on generation rates, transmission rates, unbundled distribution costs and WESM prices, which can be accessed via the DOE website (www.doe.gov.ph).

3. *Competitive Selection Process Policy*

With the government's thrust of ensuring that all DUs must supply an adequate power and reserves to serve its respective captive market in the least cost manner, the Competitive Selection Process (CSP) Policy through DC2018-02-0003 titled "*Adopting and Prescribing for the Competitive Selection Process in the Procurement by the Distribution Utilities of Power Supply Agreement for the Captive Market*" was issued on 01 February 2018. The policy prescribes the conduct of CSP as a clear, transparent and fair supply procurement process that will promote competition and greater private sector participation in the provision of least-cost, reliable and adequate supply of electricity. It addresses the power supply contracting of the electric power utilities serving both on-grid and off-grid areas in the country.

In compliance with its provisions, DUs are required to establish a Third-Party Bids and Awards Committee (TPBAC) or Joint TPBAC or may opt to engage a Third-Party Auctioneer in lieu of the TPBAC or Joint TPBAC. Further, the selection process of the TPBAC or Joint TPBAC captive customer representatives must be submitted to DOE for approval. As of December 2018, the DOE has already approved the selection process of 16 DUs.

During the initial implementation of the policy, 16 DUs (15 DUs and 1 PIOU) were granted a Certificate of Exemption as of December 2018 as listed in *Table 36.*

Table 36. LIST OF DUS GRANTED EXEMPTIONS FROM THE CONDUCT OF CSP

DU	CSP Exemption	Date Approved
Ifugao Electric Cooperative Inc. (IFELCO)		5 September 2018
Manila Electric Company (MERALCO)	One-Year PSA with Therma Mobile, Inc.	11 September 2018
Romblon Electric Cooperative, Inc. (ROMELCO)	Cobrador Solar-Diesel Battery Hybrid Power Generation System	18 September 2018
Northern Samar Electric Cooperative, Inc. (NORSAMELCO)	Contract for the Supply of Electric Energy (CSEE) with PSALM for the period 26 December 2018 to 25 December 2019	6 November 2018
Iloilo III Electric Cooperative, Inc. (ILECO III)	PSA with National Power Corporation (NPC) for Gigantes Island, Iloilo for the period 26 December 2017 to 25 December 2022	27 November 2018
Leyte II Electric Cooperative, Inc. (LEYECO II)	CSEE with PSALM for the period 26 December 2018 to 25 December 2019	27 November 2018
Leyte IV Electric Cooperative, Inc. (LEYECO IV)	CSEE with PSALM for the period 26 December 2018 to 25 December 2019	27 November 2018
Bohol I Electric Cooperative, Inc. (BOHECO I)	CSEE with PSALM for the period 26 December 2018 to 25 December 2019	27 November 2018
Samar I Electric Cooperative, Inc. (SAMELCO I)	CSEE with PSALM for the period 26 December 2018 to 25 December 2019	27 November 2018
Don Orestes Romualdez, Electric Cooperative, Inc. (DORELCO)	CSEE with PSALM for the period 26 December 2018 to 25 December 2019	27 November 2018
Eastern Samar Electric Cooperative, Inc. (ESAMELCO)		27 November 2018
Biliran Electric Cooperative, Inc. (BILECO)		11 December 2018
Southern Leyte Electric Cooperative, Inc. (SOLECO)		11 December 2018
Samar II Electric Cooperative, Inc. (SAMELCO II)		20 December 2018
Isabela I Electric Cooperative, Inc. (ISELCO I)		20 December 2018

4. Performance Assessment and Audit

To implement the PAA for the distribution system, the Performance Assessment and Audit Team on Distribution System Facilities (PAAT-DSF) has been created under DC2017-05-0008. The PAAT-DSF is chaired by DOE and composed of NEA, Distribution Management Committee, TransCo and PEMC. The list of 2018 PAA conducted activities for distribution system is shown in *Table 37*.

Table 37. PAA ACTIVITIES CONDUCTED in 2018

Grid	Facility
Luzon	Masbate Electric Cooperative, Inc. (MASELCO) First Catanduanes Electric Cooperative, Inc. (FICELCO) Oriental Mindoro Electric Cooperative, Inc. (ORMECO) Albay Electric Cooperative, Inc. (ALECO)
Visayas	Bohol I Electric Cooperative, Inc. (BOHECO I) Bohol II Electric Cooperative, Inc. (BOHECO II) Bohol Light Company, Inc. (BLCI)
Mindanao	Davao Light and Power Company (DLPC)

Findings and recommendations from PAA activities were presented on 21 May 2019 during a workshop organized by the DOE in coordination with the NPC and NEA. The workshop was intended to have a common understanding of the situation, and to ensure implementation of the recommended policies, programs and strategies through an action Plan.

5. Direct Connection Applications of Industrial, Commercial and Other Electricity End-Users

Pursuant to Section 9 of Electric Power Industry Reform Act (EPIRA), which states that TransCo or its Buyer/Concessionaire shall provide open and non-discriminatory access to its transmission system to all electricity users, the DOE issued DC No. 2018-08-0025 on 24 August 2018 "*Prescribing the Rules Governing the Review and Evaluation of Direct Connection Applications of Industrial, Commercial and Other Electricity End-Users*". The DC allows transparent guidelines on the assessment of applications for direct connections to the Grid or sub-transmission assets that are still owned by TransCo. Applications were previously being reviewed by the ERC until the Supreme Court ruled that the distribution of energy resource, specifically direct supply of electricity is not within the authority of ERC but falls within the DOE's jurisdiction. In May 2014, the ERC endorsed to the DOE all direct connection applications.

The DC also provides the creation of Direct Connection Review and Evaluation Committee (DREC) with primary mandate to evaluate all applications and recommend for the approval of the DOE Secretary. As of October 2018, 15 applications were reviewed and evaluated by the DREC, of which, two (2) applications were approved, namely Summit Iron and Pueblo de Panay Technopark *(Table 38)*.

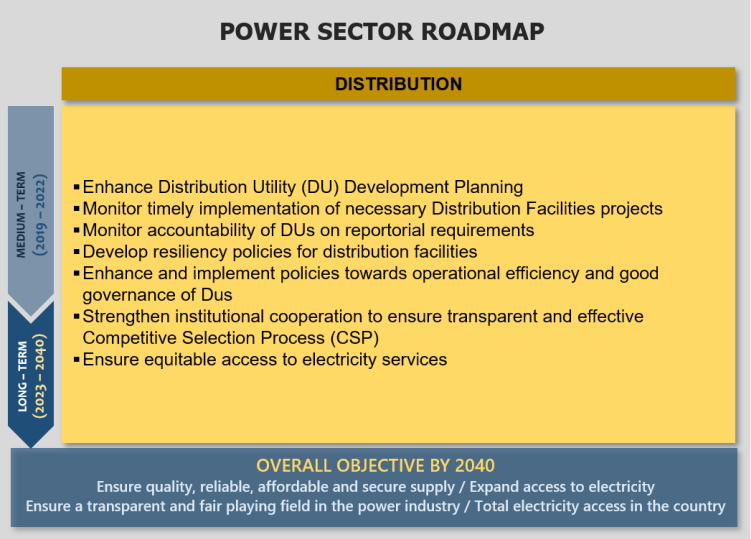
Table 38. STATUS OF APPLICATIONS FOR DIRECT CONNECTION as of 28 October 2018

	No. of Projects
Approved	2
Denied	1
Confirmed	4
Terminated	8
Total	**15**

PLANS AND PROGRAMS

The initiatives implemented in the short-term remain as continuing agenda for the DOE in the medium- to long-term period. Realization of infrastructure projects is a priority undertaking of the government coupled with effective policy framework and reinforced strategies and programs. These efforts are expected to improve the operations and quality of services provided to the electricity end-users.

Figure 71. POWER DISTRIBUTION ROADMAP



1. *Enhance Distribution Utility's Development Planning*

A draft circular directing amendment and providing additional guidelines to DC No. 2004-02-002, titled *"Prescribing the Guidelines for the Formulation of a Five-Year Distribution Development Plan,"* is expected to be adopted and promulgated within the medium-term. The corresponding manual of instructions will be drafted and disseminated to properly guide the DUs in filling up the new DDP form (DOE-EPIMB Form 2018-01-01), which is composed of four major sections, namely; (1) Introduction and Legal Basis; (2) Objective; (3) Forms and Annexes; and (4) Summary Outputs.

In accordance with the timeline set forth in the EPIRA, the DOE-EPIMB Form 2018-01-01 shall be submitted every 25th of January each year. A series of workshops will also be conducted to ensure that the DUs conform with the new guidelines as prescribed.

2. *Monitor timely implementation of necessary Distribution Facilities projects*

To ensure reliability, security and sustainable delivery of electricity to the consuming public, the DOE will facilitate the timely completion of the following infrastructure projects as indicated in the DDP 2017-2026:

- 19,934 Megavolt Ampere (MVA) additional substation capacity;
- 5,156 ckt-km for the expansion and rehabilitation of sub-transmission lines;
- 39,944 ckt-km for the expansion and rehabilitation of distribution lines.

Distribution line upgrades and expansion programs also form part of the medium- to long-term strategies to safeguard the power distribution network across the country. Interceding barriers, such as right-of-way issues, that hinder sustainable development will also be properly addressed.

3. *Monitor accountability of the DUs on reportorial requirements*

Improving data quality and developing more robust in-country monitoring and reportorial of the distribution systems will also be a major concern of the DOE within the planning period to ensure progress in the implementation of projects by the DUs. An appropriate template/matrix will be promulgated to guarantee reportorial compliance and performance indicator of the DUs.

As provided under DC2017-12-0016 (guidelines for performance assessment and audit or PAA), the DUs need to submit the compliance audit form, to effectively implement the PAA of distribution system. This enables the thorough inspection and evaluation of the operations and facilities, and adheres to the principle of efficiency, effectiveness, appropriateness and safety of the distribution network.

4. Enhance and implement policies toward operational efficiency and good governance of the DUs

Recognizing the importance to have a secured supply and delivery of electricity to propel economic activities, the DOE continues to espouse policies to improve the operational efficiency of the distribution system in the country. Creating better working conditions further improve performance, and thus achieve developmental objectives, including enhancing cooperation within the distribution network.

5. Strengthen institutional cooperation to ensure transparent and effective Competitive Selection Process

In support of the government's call for greater transparency and competition in the power supply procurement process of the DUs, the DOE institutionalizes collaboration among participating entities under the CSP policy to effectively implement the governing principles stipulated in the DC. Allowing equal opportunity and wide dissemination of bid opportunities to eligible and qualified generation companies encourage greater participation. This will also gather wide range and broad-based support and cooperation among energy stakeholders.

6. Ensure equitable access to electricity services

Enabling access to basic electricity services brings significant economic benefits to communities. This redounds to increased business activities, economic productivity and income. Mindful of this, the DOE continues to look for strategic solutions and pragmatic approaches to achieve sustainable development towards the delivery of an affordable and reliable electricity services across the country.

E. RETAIL ELECTRICITY SUPPLY

The DOE is keen on the full implementation of RCOA to allow electricity end-users to buy electricity from the suppliers of their choice. Being the conduit between the suppliers and end-users of electricity, the DUs recovers their investments through the imposition of distribution wheeling charges. The move toward RCOA is pursuant to Section 31 of EPIRA. RCOA took effect when the ERC declared compliance to the conditions set forth in EPIRA, which are: a) establishment of the WESM; b) approval of unbundled transmission and distribution wheeling charges; c) initial implementation of cross subsidy removal scheme; d) privatization of at least 70.0 percent of the generating assets of the NPC in Luzon and Visayas; and, e) transfer of the management and control of at least 70.0 percent of the total energy output of power plants under contract with the NPC to the Independent Power Producer Administrators (IPPA).

In continuing pursuit of the objectives of EPIRA, the Supply Sector Roadmap for the short-term (2017 – 2018) resulted in promulgation of policies that facilitated the following: a) mandatory contestability for one (1) Megawatt (MW) and up electricity end-users; b) full open access for 750 kilowatt (kW) and above contestable customers; c) retail aggregation for minimum of 750 kW aggregated demand; and d) conduct market studies for lowering contestability to 500 kW.

ASSESSMENT

1. *Retail Competition and Open Access*

With the electricity industry having complied with the conditions as stipulated in EPIRA, RCOA was introduced on 26 June 2013 and allowed electricity end-users of 1.0 MW and above to choose their electricity suppliers. The end-users categorized as contestable customers are permitted to source their supply from retail electricity suppliers (RES) and the use of transmission and distribution systems and associated facilities subject to the payment of distribution wheeling charges duly approved by the ERC. The implementation of RCOA presented a voluntary participation from contestable customers. It was only in December 2016 that the mandatory participation of the contestable customers with an average demand of 1.0 MW and above was directed.

A Supreme Court Order on RCOA prompted the DOE to revert to voluntary participation. To advance RCOA's implementation, the threshold was reduced to 500 kW in December 2018. The implementation of retail aggregation[78] was intended to commence last December 2018 subject to the issuance of relevant guidelines.

The DCs promulgated by the DOE for RCOA's transparent and efficient implementation are highlighted in *Table 39*.

Table 39. DEPARTMENT CIRCULARS ISSUED ON RCOA IMPLEMENTATION[79]

DC No.	Title
2011-06-0006	Creating the Steering Committee Defining the Policies for the Commencement of Retail Competition and Open Access
2012-05-0005	Prescribing the General Policies for the Implementation of Retail Competition and Open Access
2012-02-0002	Designating the Philippine Electricity Market Corporation as the Central Registration Body
2012-11-0010	Providing for Additional Guidelines and Implementing Policies for Retail Competition and Open Access and Amending DC No. 2012-05-0005
2013-01-0002	Promulgating the Retail Rules for the Integration of the Retail Competition and Open Access in the Wholesale Electricity Spot Market
2013-05-0006	Enjoining all GenCos, DUs, Suppliers and Local Suppliers to Ensure an Effective and Successful Transition Towards the Implementation of the Retail Competition and Open Access.
2013-07-0014	Promulgating the Retail Manuals for the Implementation of the and Providing for Transitory Arrangement
2013-07-0013	Providing Supplemental Policies to Empower the Contestable Customers under the Regime of Retail Competition and Open Access and Ensure Greater Competition in the Generation and Supply Sectors of the Philippine Electric Power Industry
2015-06-0010	Providing Policies to Facilitate the Full Implementation of Retail Competition and Open Access in the Philippine Electric Power Industry
2016-04-0004	Providing Timelines for Compliance with the Full Implementation of Retail Competition and Open Access in the Philippine Electric Power Industry
2017-12-0013	Providing Policies on the Implementation of the Retail Competition and Open Access for Contestable Customers in the Philippine Electric Power Industry
2017-12-0014	Providing Policies on the Implementation of the Retail Competition and Open Access for Retail Electricity Suppliers in the Philippine Electric Power Industry
2018-04-0009	Adopting Further Amendments to the Retail Rules and its Market Manual on Metering Standards and Procedures for the Implementation of Enhancements to WESM Design and Operations

[78] Allows customers in a contiguous area whose aggregate demand is not less than 500 kW to source their electricity supply requirement on a group basis from a licensed supplier.

[79] On 29 July 2019, the DOE issued Department Circular No. 2019-07-0011, entitled Amending Various Issuances on the Implementation of the Retail Competition and Open Access" in order to address gaps and ensure the implementation of RCOA.

As of April 2019, the total prospective participants for RCOA already reached 2,033, an increase of 112 percent from 961 participants during RCOA's initial commercial operation *(Table 40)*. Contestable customers comprised 93.0 percent (1,884) of the prospective participants, 3.0 percent (55) are suppliers (including local retail electricity suppliers[80]) and the remaining 4.0 percent (94) are RCOA service providers.

Table 40. SUMMARY OF RCOA REGISTRATION

Membership Category		Prospective*			Registered**		
		Jun 2013	April 2019	Increase	Jun 2013	April 2019	Increase
Contestable Customers	D ≥ 1MW	892	1,356	52%	239	999	318%
	750kW ≥ D > 1MW	0	528		0	241	
	Total	*892*	*1,884*	111%	239	1,240	419%
Suppliers	RES	19	30	58%	15	30	100%
	LRES	13	25	92%	3	14	367%
	Total	32	55	72%	18	44	144%
SOLR		9	46	411%	0	24	
RMSP		28	48	71%	18	48	167%
Grand Total		**961**	**2,033**	**112%**	**275**	**1,356**	**393%**

For the same period, the total RCOA participants registered with the Central Registration Body (CRB) stood at 1,356[81]. From the registered contestable customers, 81.0 percent (999 customers) is within the 1.0 MW threshold, and the rest (19.0 percent or 241 customers) is within the 750 kW – 1 MW.

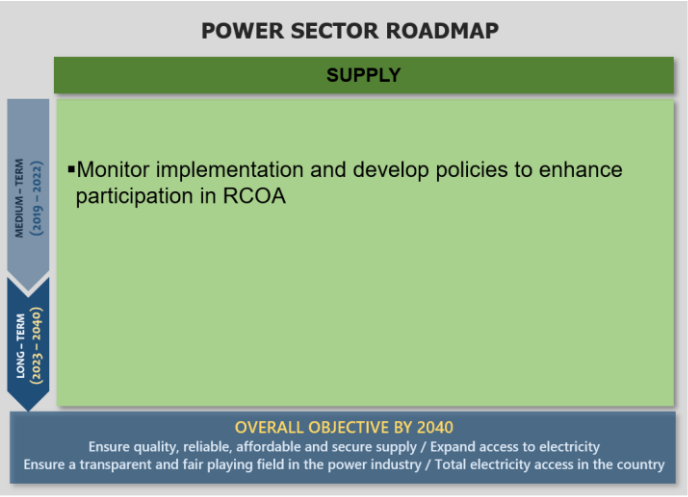
Policy and regulatory issuances relating to RCOA were also promulgated in 2018 and these are *ERC Resolution No. 9 Series of 2018*[82] and the *DOE DC 2018-04-0010*[83]. The former specifies that the customer may choose its payment option whether single or multiple billing scheme. It also provides that the contestable customers have the option to contract on its own directly to RES and/or WESM for their supply and to the network service provider for metering services. In such setup, customers are billed separately for the services. Meanwhile, the latter clarifies the application and treatment of retail market participants under the WESM rules and specifies the application of standards under the DUs to the contestable customers.

PLANS AND PROGRAMS

As a continuing action plan that spans from the medium- to long-term, the supply subsector will be resolute in the monitoring and development of policies to enhance RCOA participation *(Figure 72)*.

The policies to be developed further the realization for electricity end-users to secure their preferred supply

Figure 72. POWER SUPPLY ROADMAP



[80] Local Retail Electricity Suppliers (LRES) refer to DUs authorized by the ERC to serve contestable customers.
[81] Contestable customers, suppliers and RCOA service providers are required to register in the CRB. The new designated CRB is IEMOP, the current IMO which assumed the market operator function of PEMC in 25 September 2018.
[82] Resolution Adopting the ERC Rules Supplementing the Switching and Billing Process and Adopting a Disconnection Policy for Contestable Customers.
[83] Adopting Further Amendments to the Wholesale Electricity Spot Market (WESM) Rules, Retail Rules and Retail Market Manual on Metering for Clarifications on Retail Market Integration.

sources – *those within the thresholds of 1.0 MW and above, 750 kW – 1.0 MW, and 500 kW – 749 kW*. Once the end-users (contestable customers) have the power of choice, it marks a turning point for the industry.

The retail aggregation covering the 750 kW–1.0 MW demand accordingly relies on ERC's promulgation of requisite guidelines to ensure proper application. In addition, the DOE and ERC are bent on formulating/developing policies to lower the threshold to 500 kW and aggregation for the specified demand.

F. WHOLESALE ELECTRICITY SPOT MARKET DEVELOPMENT

The Market Development Roadmap identified a number of action plans to be carried out in the short-term (2017 – 2018) geared towards enhancing the implementation of WESM. Specifically, strategies are anchored on developing policies and monitoring compliance on the following: a) WESM design improvements / new market management system (NMMS); b) appointment of independent market operator (IMO); c) privatization of the NPC assets; d) policy for embedded generators; e) establishment of the Mindanao Electricity Market; f) development of a roadmap and policy on the utilization of smart grid and other technologies; g) Renewable Energy Market or REM in line with RPS implementation; h) reserve/energy market co-optimization; i) demand bidding in the WESM; and j) forwards market/financial transmission rights/day-ahead market/derivatives market.

Enhancing the electricity market through policy development is a continuing action plan and covers the period from the short- to long-term (2017 – 2040). Policies were also aligned with the requirements of RA 9513, which mandates the preferential treatment and higher utilization of RE.

ASSESSMENT

1. WESM Design improvements / NMMS

The start of WESM's commercial operation in Luzon was on 26 June 2006 while Visayas grid's integration in the WESM commenced on 26 December 2010. The market serves as the venue for trading electricity as a commodity and a clearing house to reflect the economic value of electricity for a particular period as indicated by a spot price.

The electricity market's key features are: a) a gross pool system for scheduling contracted and uncontracted generation and balancing supply and demand; b) a price determination process, which sets the marginal value of all electricity produced and consumed by time and location at all nodes; and c) a financial settlement process in which the customers pay for electricity purchases and generators receive payments for electricity produced.

The DOE's promulgation of DC 2015-10-0015 titled "*Providing Policies for Further Enhancement of the WESM Design and Operations*" in November 2015 instigated the move to develop WESM design and operations enhancements. The enhanced WESM design features the following changes: a) shortening of scheduling and pricing intervals from one (1) hour to five (5) minutes, and ex ante only pricing to better reflect the changes in supply and demand, and potentially reduce the requirement for frequency regulation reserve; b) automatic re-runs when prices reflect constraint violations to provide timely disclosure of settlement-ready prices; and, c) hour-ahead projections (in addition to the week-ahead and day-ahead projections) to facilitate commitment decisions of trading participants.

PEMC as the Market Operator (MO) procured the New Market Management System (NMMS) that bears the changes and capable of: a) automatically detecting non-compliances to WESM rules, specifically must-offer rule and conformity to dispatch standards; and, b) accommodating additional market products (e.g. reserve market and forwards market).

The MO also procured, side by side with the NMMS, the Central Registration and Settlement System (CRSS), which automates registration and settlement processes for both wholesale and retail transactions.

In 2018, the MO carried out the following activities related to the market system: a) roll-over of software certification audit activities of the NMMS; b) parallel operations of the NMMS in Luzon and Visayas and Trial Operations in Mindanao; and c) soft launch of the CRSS in Luzon and Visayas and Trial Operations in Mindanao. The DOE also continued to monitor the completion of the software certification audit of the NMMS and carried out various activities to assist the MO in the successful deployment of its NMMS and CRSS. It should be noted that NMMS' operation is dependent on the approval of the amended WESM price determination methodology (PDM), which reflects the enhancements in WESM design made by the ERC.

To date, the Independent Electricity Market Operator of the Philippines (IEMOP), in collaboration with PEMC, DOE and ERC, is finalizing the independent certification audit of the NMMS and CRSS to ensure that the new developed software and systems are in accordance with the market rules. Further, PEMC together with IEMOP conducted market readiness and assessment (MRA) through an independent consultant and the final report was presented to the Philippine Electricity Market (PEM) Board last 31 July 2019. IEMOP has been continuously implementing the NMMS parallel operation to further test and familiarize the market participants with the new NMMS and CRSS.

As mandated by EPIRA, the DOE continually reviews and promulgates proposed changes to the WESM Rules, Retail Rules and Market Manuals to ensure consistency of amendments with the objectives of EPIRA, WESM and RCOA. Under the action plan of developing policies related to WESM design improvements and NMMS, the DOE promulgated nine (9) related DCs in 2018 as shown in *Table 41.*

Table 41. PROMULGATED DCS RELATED TO WESM AMENDMENTS TO ENHANCE MARKET DESIGN, DISPUTE RESOLUTIONS AND RULES CHANGE PROCESS

DC No.	Title	Objective
2018-04-0007	Adopting Further Amendments to the WESM Rules and Market Manual on Dispatch Protocol for the Implementation of Enhancements to WESM Design and Operations	Facilitates the implementation of the new market features pursuant to the DOE policies on enhancements to market design and operations and the amended WESM Rules for NMMS through DC Nos. 2015-10-0015 and 2016-10-0014.
2018-04-0008	Adopting Further Amendments to the WESM Market Manuals on Billing and Settlement and Load Forecasting Methodology for the Implementation of Enhancements to WESM Design and Operations	Facilitates the implementation of the new market features pursuant to the DOE policies on enhancements to market design and operations and the amended WESM Rules for the NMMS.
2018-04-0009	Adopting Further Amendments to the Retail Rules and its Market Manual on Metering Standards and Procedures for the Implementation of Enhancements to WESM Design and Operations	Aligns the provisions of the Retail Manual on Metering Standards and Procedures with the Retail Rules and relevant regulatory issuances for the smooth implementation of RCOA. Amendments reflect the enhancements to the design and operations of the WESM.
2018-04-0011	Adopting Further Amendments to the WESM Market Manual on Market Operator Information Disclosure and Confidentiality for the Implementation of Enhancements to WESM Design and Operations	Provides changes in the publication of market information classification, categories and requirements for the implementation of the new market features as provided under the DOE policies on enhancements to market design and operations and the amended WESM Rules for the NMMS.

2018-04-0012	Adopting Further Amendments to the WESM Market Manuals on Price Determination Methodology and Constraint Violation Coefficients and Pricing Re-Run for the Implementation of Enhancements to WESM Design and Operations	Corrects the calculation of price adjustments for customers during market intervention or suspension. Clarifies provisions on additional compensation for Must-Run Units and constrained-on generating units. Provides details and additional constraints on transmission equipment, revise the order and nomenclature of constraint violation coefficients (CVCs) for consistency with the newly amended Philippine Grid Code.
2018-05-0015	Adopting Further Amendments to the WESM Rules and Market Manuals for the Implementation of Enhancements to WESM Design and Operations (Provisions for Metering, Market Trading Node and Scheduling Point)	Addresses possible instances when main revenue meters fail and enhance documentation and metering processes to address independent market operations audit findings. Aims to enhance the performance rating of the WESM Metering Services Provider, clarify the location of metering points in the WESM for the improvement on the accounting of system losses, consider the implementation of enhancements to the design and operations of the WESM and update the affected Market Manuals, which include Market Network Model Development and Maintenance – Criteria and Procedures and Registration, Suspension and De-registration Criteria and Procedures.
2018-05-0016	Adopting Further Amendments to the WESM Rules and Market Manual on Dispute Resolution	Enhances the procedures in the WESM mediation and arbitration and updates the provisions for schedule of arbitration fees and administrative costs.
2018-07-0018	Adopting Further Amendments to the WESM Rules and Market Manual on Procedures for Changes to the WESM Rules, Retail Rules and Market Manuals	Reflects the revised procedures for the approval of amendments to the WESM Rules and Market Manuals as set out in DC 2015-07-0013.
2018-08-0022	Adopting Further Amendments to the WESM Rules and Market Manuals on the Participation of Battery Energy Storage Systems and Pumped-Storage Units in the WESM	Provides a framework for the WESM participation of emerging electrical resources such as the battery energy storage systems and pumped-storage units. Includes amendments on the provisions for registration, dispatch protocol and market network model.

2. *Appointment of an Independent Market Operator*

The creation of an IMO stems from the EPIRA provision on WESM (Section 30). Part of Section 30 explicitly mentions that the WESM shall be implemented by a market operator (MO) in accordance with the WESM rules. The MO shall be an autonomous group, to be constituted by DOE, with equitable representation from electric power industry participants, initially under the administrative supervision of the TRANSCO. The MO shall undertake the preparatory work and initial operation of the WESM. Not later than one (1) year after the implementation of the WESM an independent entity shall be formed and the functions, assets and liabilities of the market operator shall be transferred to such entity with the joint endorsement of the DOE and the electric power industry participants.

WESM establishment paved the way for the creation of PEMC[84] which served as the Autonomous Group Market Operator (AGMO) from August 2004 to 25 September 2018. The DOE in coordination with PEMC undertook several activities to ensure compliance with the required establishment of an IMO, one of which is the conduct of studies on appropriate arrangements and consultations with the various stakeholders and the Joint Congressional Power Commission (JCPC).

On 17 January 2018, the DOE issued DC 2018-01-0002 titled "Adopting Policies for the Effective and Efficiency Transition to the Independent Market Operator for the Wholesale Electricity Spot Market," which reiterates that the IMO shall be an independent entity incorporated as a private corporation under the Corporation Code of the Philippines. The IMO shall execute the functions

[84] Incorporated in November 2003 as a non-stock and non-profit corporation. Designated as AGMO in August 2004.

of the MO as espoused in EPIRA and its IRR, WESM Rules and Market Manuals and other relevant rules/regulations and issuances. The governance function is retained by PEMC as it will still be responsible for overseeing and monitoring the activities of the IMO for it to perform its obligations as set out in the WESM Rules and Market Manuals.

The industry participants of PEMC during its membership meeting on 6 February 2018 endorsed the transition to IMO with the approval of the "Plan for Transition to the IMO of the Philippine WESM." IEMOP[85] was incorporated on 15 May 2018 under the Securities and Exchange Commission (SEC) with a Company Registration No. CN201807379, and will function separately from PEMC. IEMOP's incorporation was made by individuals who are independent from the electric power industry participants and from the government. The initial IEMOP Board was selected and confirmed by the PEM Board and the DOE Secretary last 25 June 2018 during the first PEMC annual membership meeting. The seven (7) Board of Directors designated are listed in *Table 42*.

Table 42. IEMOP BOARD OF DIRECTORS

Name	Positions
Lt. Gen. Ralph A. Villanueva AFP (Ret)	Chairman
Atty. Francis Saturnino C. Juan	President and CEO
Atty. Caroll U. Tang	Director and Corporate Secretary
Atty. Richard J. Nethercott	Director and Treasurer
Engr. Jose Mari T. Bigornia	Director and COO
Engr. Jose Rodelio Varilla Mangulabnan	Director
Maj. Gen Vicente M. Porto AFP (Ret)	Director

An operating agreement was signed between PEMC and IEMOP on 19 September 2018 for the transfer of assets, liabilities, personnel and market operator related functions. This agreement defines the parties' rights and obligations in relation to the transfer and outlines the parties' roles and functions *(Table 43)*. The functions of the MO as provided in the EPIRA and its IRR, WESM Rules, WESM Market Manuals and other official issuances was assumed and performed by IEMOP on 26 September 2018 at 00:00 H.

Table 43.OBLIGATIONS AND RESPONSIBILITIES OF IEMOP AND PEMC

IEMOP	PEMC
1. Market Operator Services and Market Operator Performance Standards	Retains all its other assets and associated liabilities that are not included in the assets and liabilities transferred to IEMOP, including but not limited to the systems and infrastructures being used to support its governance function.
2. Other Services a. Central Registration Body b. Mindanao Transactions c. Training of market participants, PEMC, DOE, ERC, PCC and other stakeholders d. Other participant services	
3. Renewable Energy Market Registrar	

To evaluate the effectiveness of the current IMO policies, DO 2019-03-0009 promulgated on 18 March 2019 created a Special Task Force that will assess the performance of WESM under its current structure of operations. Such assessment covers the following as stated in Section 2: a) assessment of PEMC as the governance arm of the WESM; b) assessment of the performance of IEMOP as the IMO; and c) over-all performance of WESM.

[85] Name for the IMO Company. Non-stock and non-profit corporation that is separate from PEMC.

The Interim Board of IEMOP has a limited term of one (1) year, which expired last 24 June 2019. However, the PEM Board recommended to keep the existing Interim Board to prevent disruption of services and ensure continued operations of WESM until the assessment results are put into place or until a regular Board has been duly elected. The DOE is also in agreement with the said recommendation.

3. Establishment of the Wholesale Electricity Spot Market in Mindanao

With WESM already established in Luzon and Visayas, Mindanao remains without an electricity market on operation.

On 04 May 2017, the DOE issued DC 2017-05-0009 titled *"Declaring the Launch of Wholesale Electricity Spot Market (WESM) in Mindanao and Providing for Transition Guidelines."* Said DC provides for the following: a) commencement of registration of WESM participants; b) application of the Interim Mindanao Dispatch Protocol until commercial operations is declared by the DOE; and, c) termination of the Interim Mindanao Electricity Market (IMEM).

On 28 June 2017, WESM was formally launched in Mindanao and it is seen as a medium for providing an efficient scheduling, dispatch and settlement of energy withdrawal and injections in the grid. The market also embodies competition and transparency that is aimed at the Mindanao electricity consumers. This also signaled the commencement of the Trial Operations Program (TOP) that was participated in by the MO, SO and trading participants.

For its part, the DOE monitors all preparatory activities related to the full commercial operation of WESM in Mindanao. The declaration of full commercial operation will be made once the criteria set forth is complied with – *systems and procedure, TOP, operationalization, trainings, PDM and NMMS.* The DOE also continues to work with both MO and SO to ensure the systems and infrastructure readiness for WESM's commercial operation. Corollary to this, major interface links between the two (MO and SO) have been established and tested for consistency, accuracy and redundancy. The NGCP has also installed WESM compliant metering and real-time monitoring facilities in most trading participants' sites in Mindanao.

Another significant criterion in the declaration of commercial operation of WESM in Mindanao is the registration of power industry participants. A total of 81 participants or 94.0 percent of the expected total participants have started the registration process with MO (as of 11 June 2019). The TOP for the participants scored an overall execution of 34.0 percent.

Given the DOE's readiness assessment, the commercial operation of WESM in Mindanao is expected by 3rd quarter of 2019 pending the ERC's approval of the PDM adopting the five-minute dispatch interval.

4. Policies on Embedded Generators, Ancillary Service and Demand Bidding in the WESM

Policy development is an integral component in the power sector's roadmap. In the short-term, the Department formulated policies covering embedded generators and ancillary services (AS). Discussions were also started on demand bidding in the WESM.

- ***Embedded Generators***

Embedded generators (EGs) pertain to generating units that are indirectly connected to the grid through the DUs lines or industrial generation facilities that are synchronized with the grid.

With the influx in the use of EGs, the DOE needed to clarify the policies governing decentralized generation considering the benefits it may provide, while ensuring that these are operated within the framework of centralized power system. To set the context in relation to its optimal operation or utilization, the DOE issued on 8 February 2019 DC 2019-02-0003 titled *"Providing for the Framework Governing the Operations of Embedded Generators."*

As embodied in the DC, EG shall operate within the following framework: a) provision of central dispatch by SO to EGs with material impact to grid operations in the interest of achieving economic operation and maintenance of quality, stability, reliability and security of the transmission system; b) compliance to the EPIRA and its IRR, Philippine Grid Code (PGC), Philippine Distribution Code (PDC), WESM Rules and its Market Manuals, Philippine Electrical Code and other pertinent issuances by the DOE, ERC and other relevant government instrumentalities having authority over the grid reliability and supply security; and c) market share and bilateral contracts limitation under Section 45[86] of EPIRA and other relevant regulations issued by the ERC concerning abuse of market power and competition.

The DC also specified the requirements for licensing, connection, market registration and participation. It also covers the EGs' provision of ancillary, as well as metering services. The DC also provides for the delineation of responsibilities and support of DUs, MO, Transmission Network Provider, SO and ERC.

- ***General Framework Policy for Ancillary Services***

As a means to effectively utilize ancillary services in the grid, the DOE drafted a DC in 2019 on adopting a general framework on the provision and utilization of such services. As defined, ancillary service refers to the services necessary to support the transmission of capacity and energy from resources to loads, while maintaining reliable operation of the transmission system in accordance with good utility practice and the Grid Code to be adopted in accordance with EPIRA.

The DC was promulgated on 04 December 2019 as Department Circular No. DC2019-12-0018. The policy provided a general framework for ancillary service encompassing the issues identified, which include among others the following: a) harmonization of the guidelines, rules, and regulations concerning the operation of the grid; b) proper accountability among concerned entities in the efficient and transparent operation of the grid; c) transparent and cost-effective procurement of ancillary services taking into account compliance to reserve requirements of each grid; d) co-optimization of energy and reserves in WESM, through central dispatch and the commercial operation of the WESM Reserve Market; and e) transparent accreditation process for ancillary services.

The DC also established the creation of a Technical Working Group (TWG), chaired by the DOE and ERC. The TWG is a recommendatory body to assist in the implementation of the DC.

[86] Cross Ownership, Market Power Abuse and Anti-Competitive Behavior

- ***Demand Bidding in the WESM***

The DOE's initiatives on demand side bidding are based on the initial discussions made with PEMC and on the matter of market derivatives.

A derivative is a contract between two or more parties whose value is in accordance with the agreed-upon underlying financial asset (like a security) or set of assets (like an index). The most common instruments include bonds, commodities, currencies, interest rates, market indexes and stocks. Derivatives are secondary securities whose value is solely based (derived) on the value of the primary security that they are linked to. Commonly used derivatives are futures contract, forward contracts, options, swaps and warrants. Derivatives are used either to mitigate risk (hedging) or assume risk with the expectation of commensurate reward (speculation)[87].

Applying this on the sector leads to the energy derivatives, which are financial instruments wherein the underlying assets are energy products including oil, natural gas and electricity. These are traded either on an exchange or over-the-counter. Moreover, energy derivatives can be options for futures or swap agreements. The value of the derivative varies as a result of the changes in price of the energy product[88].

5. *Review and Develop Power Generation Policies including Rewards-and-Penalty System*

The generation sector plays a critical role in maintaining the demand and supply balance of the power system. With the goal of enforcing full accountability of the power industry players during forced outages, the DOE explored mechanisms that aimed to penalize power generation companies for lapses and negligence incurred from their end. This measure is viewed not only to provide safety nets to the consumers but also to ensure power supply security to prevent unwanted disruptions and mitigate impacts to the power grid.

As early as 2017, the DOE initiated a policy review on the *"Causer Pay Policy Program"* and subjected the same to several focus group discussions (FGDs) and public consultations among the concerned stakeholders in the electric power industry. In the same period, the DOE drafted and finalized the DC on *"Causer Pays Mechanism."* Under the proposed DC, the penalty system imposes the incremental costs of procuring higher priced electricity to the generation companies (GenCos), Distribution Utilities (DUs) and the System Operator (SO), provided that such forced outages are intentional or has transpired as a result of negligent or incompetent operations.

Recognizing the need to align the draft DC with other cross-cutting policies, the DOE embarked on the formulation of a general policy framework for ancillary service.

6. *Develop Roadmap, Policy Utilization for Smart Grid and Other Technologies*

According to the United States-Department of Energy (US-DOE), making the grid "smarter" can be achieved through the use of cutting-edge technologies, equipment and controls that communicate and work together to deliver electricity more reliably and efficiently. This reduces the frequency and duration of power outages, limits storm impacts, and restore service faster when outages occur[89].

In 2013, the DOE created an Inter-Agency Steering Committee to develop a smart grid roadmap with the issuance of DC 2013-03-003 titled *"Creating an Inter-Agency Steering Committee for the*

[87] Source: https://www.investopedia.com/ask/answers/12/derivative.asp
[88] Source: https://www.investopedia.com/terms/e/energy-derivative.asp
[89] Source: https://www.energy.gov/oe/activities/technology-development/grid-modernization-and-smart-grid

Development and Formulation of a Comprehensive and Holistic Smart Grid Policy Framework and Roadmap for the Philippine Electric Power System."

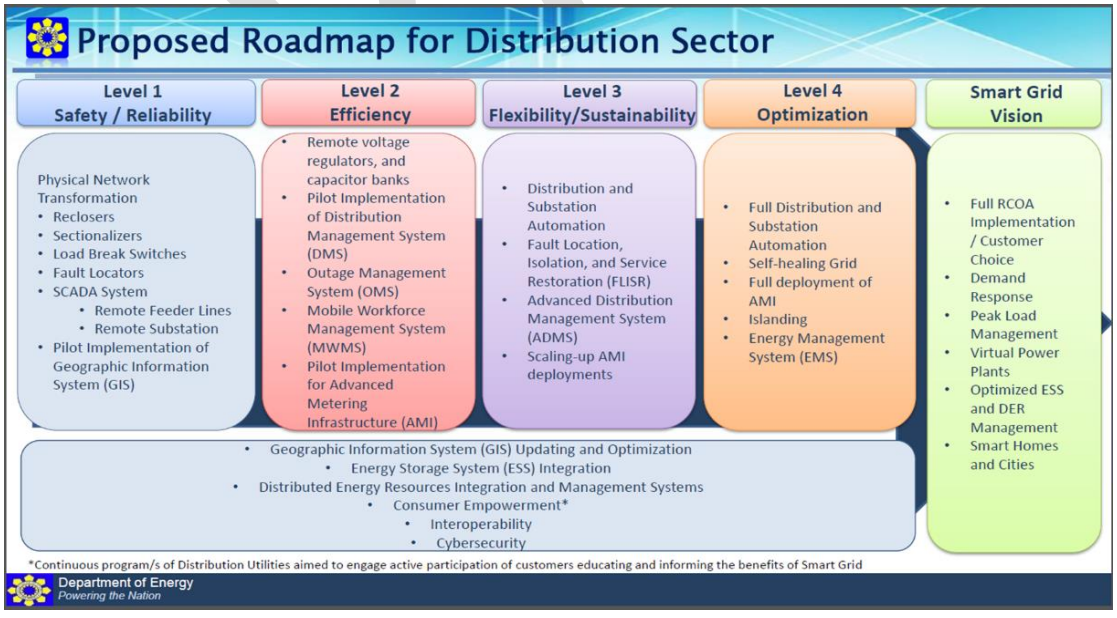
Among the deliverables of the Inter-Agency Steering Committee as postulated in Section 3 are: a) propose a National Strategy for Smart Grid for the period until 2030 with major consideration on the possible impact to the price of electricity; b) formulate and prepare the transition policies and guidelines for the effective implementation of Smart Grid by all electric power industry participants; c) prepare a roadmap for Smart Grid implementation; and, d) formulate customer education and information framework for countrywide Smart Grid.

Table 44. SG-TWG DOE LEADS

TWG	DOE Lead Bureau/Service/Office
1. Power Systems Operation	Electric Power Industry Management Bureau (EPIMB)
2. Sustainable and Renewable Energy	Renewable Energy Management Bureau (REMB)
3. ICT and Cyber Security	Information Technology and Management Services (ITMS)
4. Standardization	Energy Utilization Management Bureau (EUMB)
5. Regulatory Support	Legal Services (LS)
6. Consumer Empowerment	Consumer Welfare and Promotion Office (CWPO)

Taking off from the DC, the DOE is cognizant that it is timely to formulate a Smart Grid Policy Framework that has a twofold objective: a) ensure and encourage greater participation from power sector stakeholders; and, b) promote technology innovation, business growth and job creation. The DOE also created the Smart Grid–Technical Working Groups (SG-TWG), which focuses on six (6) key areas: a) power systems operations; b) sustainable and renewable energy; c) ICT and cyber security; d) standardization; e) regulatory support; and f) consumer empowerment *(Table 44)*.

Figure 73. PROPOSED ROADMAP FOR DISTRIBUTION SECTOR



A Smart Grid Forum was initiated by the DOE in 2017 and followed by one-on-one workshops with the leading DUs as well as FGD with energy agencies, PIOUs and ECs. The results of these discussions are aimed to serve as inputs to the DC to be formulated, which is targeted to be issued and promulgated by 2019. The proposed Smart Grid Roadmap specifically for the Distribution Sector is shown in *Figure 73*.

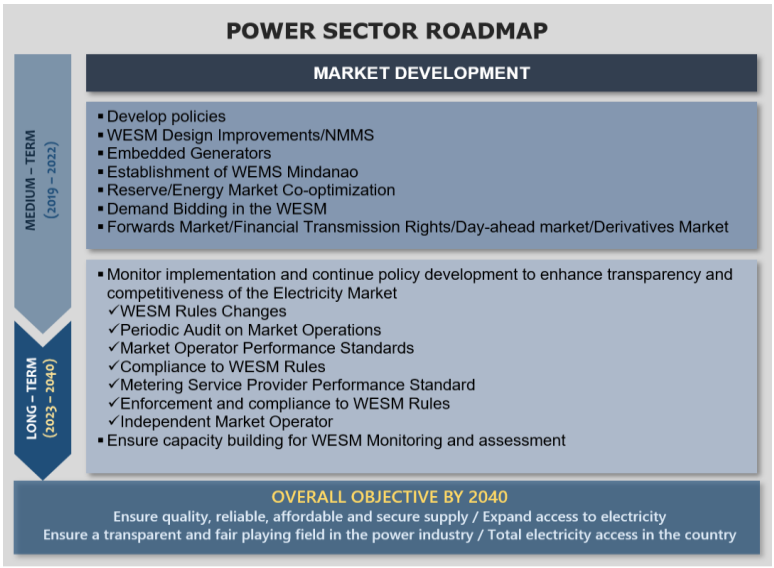
7. *Policy Issuances*

One of the policies that will impact consumers or end-users is RCOA. The policy empowers consumers because they can opt for their preferred electricity supplier, provided they belong to the right threshold of contestable customers. Having the freedom of preference for electricity supply has a bearing on electricity cost reduction and expands transparency in the electricity industry.

PLANS AND PROGRAMS

The course of the medium-term implies that the sector still needs to undertake policy development to supplement the initiatives accomplished in the short-term. These policies aspire to enhance the already established initiatives – *WESM design improvements/NMMS, embedded generators, establishment of WESM Mindanao, Reserve/Energy Market Co-optimization, demand bidding in the WESM, Forwards Market/Financial Transmission Rights/Day-ahead market/Derivatives market.*

Figure 74. MARKET DEVELOPMENT ROADMAP



In the long-term, the market development subsector undertakes monitoring of several initiatives that were carried out in the short-term and for continuous implementation in the medium-term, including new efforts. Policy development is steadily pursued to improve further transparency and competitiveness of the electricity market. Specifically, this covers *WESM rules changes, periodic audit on market operations, market operator performance standards, compliance to WESM rules, metering service provider performance standard, enforcement, and compliance to WESM rules and IMO*. Throughout the planning period, the DOE warrants a regular capacity-building for WESM monitoring and assessment.

G. INSTITUTIONAL AND SUPPORT MECHANISM

The institutional and support mechanism was put in place to sustain the implementation of the action plans identified in each power subsector for the planning horizon. As a cross-cutting and cross-sectoral initiative, it is primarily attuned to assist in the fulfilment of the EPIRA objectives.

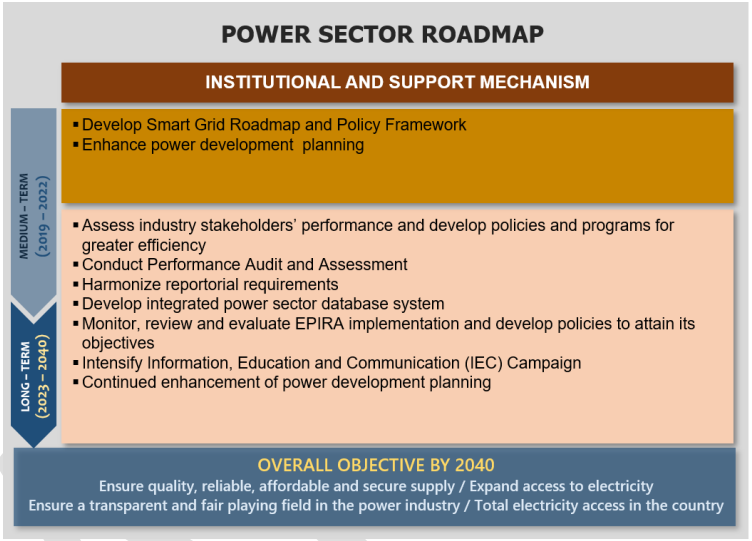
ASSESSMENT

The action plans completed in the short-term dwelled on the following: a) improvement of public and stakeholder understanding through information, education and communications (IEC) campaign; b) provision of support in the conduct of audit and review of WESM relative to market operations, WESM rules, market manuals and retail rules; c) maintenance of the electric power database management including the development of interim systems and preparation of market

operations and variable renewable energy monitoring reports; d) submission of reports to oversight – *Joint Congressional Power Commission (JCPC)* – to ensure compliance to the requirements of EPIRA and other laws; and e) enhancement of power planning, specifically in generation and transmission with the aid of modelling tools and optimization software.

PLANS AND PROGRAMS

Figure 75. INSTITUTIONAL AND SUPPORT MECHANISM ROADMAP



Over the medium-term, the objective is twofold – *develop smart grid roadmap and policy framework and enhance power development planning.* The action plans from the medium- to long-term mirror what were initially implemented and accomplished in the short-term. It is deemed fundamental to be continuously executed to bring about performance efficiency in the industry so that services delivered to stakeholders and consumers adhere to quality, reliability, affordability, and security. Moreover, these action plans put emphasis on the realization of EPIRA's objectives for the electricity industry.

1. *Smart Grid Roadmap and Policy*

The smart grid policy and roadmap are among the action plans specified under market development for the short-term. Advancing from DC 2013-03-003[90] wherein an Inter-Agency Steering Committee was created, the DOE led various discussions with concerned stakeholders of which the results were incorporated as inputs in the draft DC. The draft Smart Grid DC was presented to public consultations and posted on DOE's website for further comments of stakeholders. Correspondingly, an initial roadmap has been created for the distribution sector, known as the *National Smart Distribution Utility Roadmap (SDUR)*. The Smart Grid Policy is targeted to be implemented by fourth quarter of 2019.

2. *Enhance Power Development Planning*

As a continuing action plan over the planning period, enhancement of power development planning is critical in the DOE's mandate. The DOE is required to formulate and update annually the PDP, which details the electricity demand and supply outlook of the country. Moreover, improvement in supply expansion planning capability entails the procurement and application of power planning tools, specific for generation and transmission.

[90] "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 System."

3. *Assess Industry Stakeholder's Performance and Develop Policies and Programs for Greater Efficiency*

As an approach in the evaluation of industry performance, the DOE is set to continue conducting PAA activities. It also functions as a mechanism to gauge the performance and efficiency of power facilities based on mandated operational standards.

4. *Monitor, Review and Evaluate EPIRA implementation*

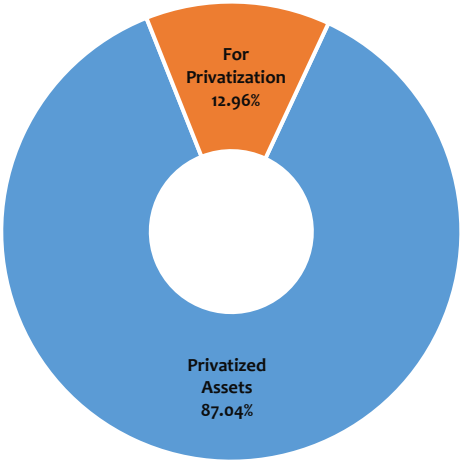
The DOE after reviews and series of focus group discussions and public consultations with the stakeholders, drafted a department circular entitled, "Amending Certain Provisions of the Rules and Regulations to Implement Republic Act No. 9136, entitled "Electric Power Industry Reform Act of 2001".

The draft department circular propose to among others, (a) Clarify the responsibilities of the DOE, ERC, TRANSCO and its buer/concessioner relative to the TDP; (b) Clarification on the mandated of NEA relative to its authority and responsibility over the ECs towards viably operating in the deregulated electricity market and ensuring the total electrification of the country; (c) Alignment of the ERC mandate to ensure that Suppliers would comply to rules concerning anti-competitive behavior and market share limitations, including unbundling provisions as required under Section 36 of the Law; (d) Emphasis on the compliance of generation companies including embedded generators and distribution utilities to Philippine Grid Code (PGC), Philippine Distribution Code (PDC) and Wholesale Electricity Spot Market (WESM) Rules; (e) Rationalization of the subsidies for missionary electrification; (f) Authority for TransCo or its Buyer/Concessionaire to operate, maintain, and develop the transmission system in any Small Power Utility Group (SPUG) area that has been identified by the DOE as viable; (g) Separation of accounts of related business of distribution and transmission utilities subsidization among related businesses; (h) Determination of remote and unviable areas for the provision of electricity; (i) Exemption from the imposition of universal charge for self-generating entities; (j) Rationalization of lifeline rates subsidy; and (k) Clarification on the PSALM mandates on the administration of universal charge.

- ***Privatization of NPC Assets***

EPIRA mandates the overall restructuring of the country's electricity industry and calls for the privatization of NPC. The move for privatization was deemed to introduce competition and level the playing field in both generation and supply sectors. The government's privatization efforts primarily pinpoint to power generating facilities, as well as the power supply contracts. Majority of the privatization activities done by the government were from 2007–2016 wherein major assets of NPC, IPP Contracts and transmission assets were turned over to the private sector.

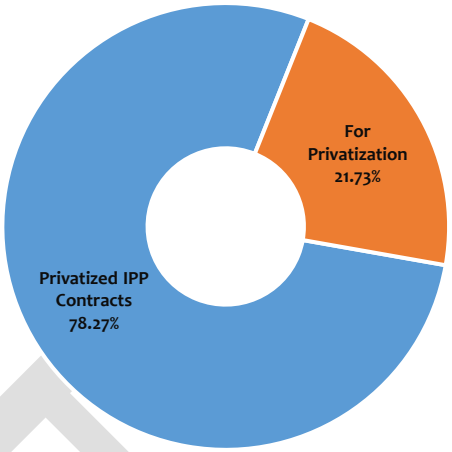
Figure 76. PRIVATIZATION OF GENERATION (As of April 2019)



The privatization level of the NPC's generating assets in Luzon and Visayas is already at 87.0 percent as of April 2019 wherein 4,364.30 MW of the 5,014.30 MW are already privatized *(Figure 76)*. The remaining 13.0 percent for privatization is the Malaya Thermal Power Plant (MTPP) with a capacity of 650 MW.

On the IPP contracts, privatization was recorded at 78.3 percent of the total contracted capacities and this is equivalent to 3,415.00 MW of the 4,362.92 MW *(Figure 25)*. This covers coal (Sual and Pagbilao), hydro (San Roque, Bakun), natural gas (Ilijan) and geothermal (Unified Leyte Strips Energy).

Figure 77. PRIVATIZATION OF IPP CONTRACTS (As of April 2019)



The revenue generated by PSALM from the privatization of generation assets, transmission business and IPP contracted capacities totaled PhP 910.16 Billion. Actual collections as of April 2019 stood at PhP 571.43 Billion and with a collectible balance of PhP 338.73 Billion[91]. PSALM was able to achieve 100 percent collection stemming from the auctioned generating assets and decommissioned plants. The remaining collectibles are from the balances of TransCo's transmission assets (concession fees) and appointment of IPPA. The utilization of the privatization proceeds was solely used for the liquidation of PSALM's financial obligations as provided under EPIRA.

- ***Malaya Thermal Power Plant***[92]

The privatization package of MTPP in line with DOE's directive to PSALM and as relayed by the latter to DOF includes the land underlying the plant with an estimated area of 26.28 hectares (ha) consisting of five parcels of land registered under the Republic of the Philippines.

Four bidders were declared compliant by PSALM-Bids and Award Committee (BAC) on 28 November 2018 with all the requirements of the documentary deliverables. The compliant bidders are: 1) AC Energy Inc.; 2) D.M. Wenceslao & Associates, Inc.; 3) DMCI Power Corporation; and 4) FGEN Reliable Energy Holdings, Inc. The Final Asset Purchase Agreement was issued to the qualified bidders, after a meeting held with them. PSALM also issued Supplemental Bid Bulletin No. 6 amending the bid submission deadline from 24 April 2019 to 14 June 2019. This was considered in time for the issuance of the Notice to Proceed (NTP) to the Third-Party Consultant for the valuation of the MTPP.

- ***Procurement of the Third-Party Consultant for the Valuation of MTPP***

PSALM's Board of Directors directed the procurement of a third-party consultant to undertake the valuation of assets. Three bidders participated during the bidding held on 04 March 2019, namely a) Price Waterhouse Coopers (PWC), b) Beyond Energy, Inc. (BEI), and c) Lantau Group.

On 15 March 2019, the PSALM-BAC declared PWC as the winning bidder with the highest rated technical proposal, and subsequently approved by the Head of the Procuring Entity. PSALM issued

[91] Source: https://psalm.gov.ph/financial/privatizationproceeds
[92] PSALM EPIRA Status Report for December 2018

the Notice of Award to PWC on 22 April 2019. In line with this, the timeline for MTPP's privatization activities has also been adjusted.

- ***Privatization Schedule***

To date, eight (8) generating assets are still up for privatization with a total capacity of 1,651.1 MW (*Table 45*). The privatization of the Agus-Pulangi hydro complexes will be subject to consultation with Congress and PSALM Board's policy direction. On the appointment of IPPAs, there are still three plants remaining with a total capacity of 1,225.92 MW, the largest of which is the Caliraya-Botocan-Kalayaan (CBK) hydroelectric power plant with a capacity of 797.92 MW *(Table 46).*

Table 45. INDICATIVE PRIVATIZATION SCHEDULE FOR GENERATION ASSETS, 30 April 2019

Plant Name	Rated Capacity (MW)	Bid Date
Malaya Thermal Power Plant	650.00	2019
Agus 1 & 2 HEPP	260.00	For rehabilitation. Privatization is subject to consultation with Congress and PSALM Board's policy direction.
Agus 4 & 5 HEPP	213.10	
Agus 6 & 7 HEPP	273.00	
Pulangi 4 HEPP	255.00	
Total	**1,651.10**	

Source: https://psalm.gov.ph/rpa/rop

Table 46. INDICATIVE PRIVATIZATION SCHEDULE FOR THE APPOINTMENT OF IPPAS, 30 April 2019

Plant Name	Rated Capacity (MW)	Bid Date
Caliraya-Botocan-Kalayaan (CBK) HEPPs	797.92	2020
Casecnan HEPP	228.00	2021
Mindanao Coal-fired Thermal Power Plant (CFTPP)	200.00	2022
Total	**1,225.92**	

Source: https://psalm.gov.ph/rpa/rop

H. MISSIONARY ELECTRIFICATION

Consistent with its overall mandate and the policy objectives of EPIRA, the DOE remains firm in fulfilling its commitment to perform missionary electrification functions throughout the country. In pursuit of this thrust, the DOE continues to develop key policies, programs and strategic measures to ensure the delivery of quality, reliable, secure and affordable electricity service in marginalized communities located in far flung and remote areas.

On the other hand, in support of the Government's total electrification agenda, the DOE is putting best efforts to bring missionary areas into commercial viability level, to contribute in attaining inclusive growth and development. Relatedly, to realize policy reforms in the power sector, the DOE is exploring for feasible measures to rationalize the subsidy mechanism, introduce necessary improvements in system operations including the modernization and entry of emerging and efficient technologies across all small island grids.

ASSESSMENT

1. *Development of the Omnibus Guidelines for Off-Grid Areas*

The DOE crafted the Omnibus Guidelines for Off-Grid Areas anchored on three main objectives that aims to: (1) accelerate access to sustainable energy; (2) rationalize the Universal Charge for Missionary Electrification (UCME); and (3) improve the efficiency, sufficiency and reliability of electricity services in off-grid areas.

Prior to its approval and signing on 25 January 2019, the DC has gone through a series of preparatory activities, such as FGD and public consultations, which were participated in by government agencies, electric power industry participants and other stakeholders involved in missionary electrification as presented in *Table 47*. On the other hand, the Omnibus Guidelines for Off-Grid Areas became effective on 10 March 2019 following its publication in the Business World and the Daily Tribune on 22 February 2019.

Table 47. PREPARATORY ACTIVITIES CONDUCTED FOR THE OMNIBUS GUIDELINES FOR OFF-GRID AREAS

Activity	Stakeholders	Date	Venue
Focus Group Discussion	NEA, NPC, DOF, NEDA, ERC, PSALM, TransCo, NGCP, Distribution Management Committee (DMC), Access to Sustainable Energy Programme (ASEP)	03 Aug. 2018	DOE AVR, Taguig City
Public Consultation	Existing and potential New Power Providers (NPPs) and Qualified Third Party (QTP) Providers interested in Missionary Electrification	03 Oct. 2018	The Legend Villas, Mandaluyong City
Public Consultation	Luzon Electric Cooperatives (ECs)	04 Oct. 2018	Sulo Riviera Hotel, Quezon City
Public Consultation	Visayas ECs	19 Oct. 2018	Cebu Parklane Hotel, Cebu City
Public Consultation	Mindanao ECs	24 Oct. 2018	The Marcian Hotel, Zamboanga City
Meeting	Busuanga Island Electric Cooperative, Inc. (BISELCO), NEA and NPC	12 Nov. 2018	NPC Boardroom, Quezon City

As a comprehensive policy governing off-grid power development, the completion of the Omnibus Guidelines encapsulates the key accomplishments based on the short-term targets under the missionary electrification roadmap.

- ***Ensure Adequate Supply in Off-Grid Areas***

To date, the NPC-Small Power Utilities Group (NPC-SPUG) still supplies majority of the power requirements in the off-grid areas despite having a Private Sector Participation (PSP) Program in place. As such, the timely completion and implementation of capacity additions and uprating projects are imperative to sustain power supply security in the islands.

Along with this effort, NPC-SPUG took advantage of EO30 by applying 32 of its power generation projects in missionary areas as EPNS. With foreseen contributions of bringing positive economic impacts to the off-grid islands, the proposed power generation projects have been granted with CEPNS as listed in *Table 48.*

Table 48. LIST OF NPC POWER PROJECTS ISSUED WITH CEPNS

Plant Type	Name of Project	Type of CEPNS	Date Issued
Oil-based	Hikdop, Surigao del Norte (1 x 200kW)	Commerciality	16 Jan. 2019
Oil-based	Talicud, Davao del Norte (3 x 200 kW)	Commerciality	16 Jan. 2019
Oil-based	Balut, Davao del Sur (1 x 300 kW and 2 x 200 kW)	Commerciality	16 Jan. 2019
Oil-based	Sacol, Zamboanga (1 x 200 kW)	Commerciality	16 Jan. 2019
Oil-based	Basilan DPP, Basilan (5 x 1,000 kW)	Commerciality	16 Jan. 2019
Oil-based	Ninoy Aquino (1 x 500 kW)	Commerciality	16 Jan. 2019
Oil-based	Palimbang (1 x 300 kW)	Commerciality	16 Jan. 2019
Oil-based	Kalamansig DPP (3 x 1,500 kW)	Commerciality	16 Jan. 2019
Oil-based	Balimbing (1 x 300 kW and 1 x 200 kW)	Commerciality	16 Jan. 2019
Oil-based	Tandubas (1 x 300 kW and 2 x 100 kW)	Commerciality	16 Jan. 2019
Oil-based	Sibutu (2 x 300 kW)	Commerciality	16 Jan. 2019
Oil-based	Manuk Mangkaw (2 x 200 kW)	Commerciality	16 Jan. 2019
Oil-based	Tandubanak (2 x 300 kW)	Commerciality	16 Jan. 2019
Oil-based	Gibusong Island, Loreto, Dinagat (2 x 50 kW)	Commerciality	16 Jan. 2019
Oil-based	Sibanag Island, Dinagat (2 x 50 kW)	Commerciality	16 Jan. 2019
Oil-based	Dinagat Island, Dinagat (2 x 1.50 MW)	Commerciality	16 Jan. 2019
Oil-based	Sarangani DPP (1 x 100 kW and 1 x 200 kW)	Commerciality	16 Jan. 2019
Oil-based	Tausan Pilas Island, Haji Muhtama (2 x 100 kW)	Commerciality	16 Jan. 2019
Oil-based	Tictabon (1 x 90 kW)	Commerciality	16 Jan. 2019
Oil-based	Manalipa (1 x 40 kW)	Commerciality	16 Jan. 2019
Oil-based	Tumaloptap (1 x 40 kW)	Commerciality	16 Jan. 2019
Oil-based	Sitangkai DPP, Tawi-Tawi (1 x 500kW)	Commerciality	16 Jan. 2019
Oil-based	Great Sta. Cruz (1 x 10 kW)	Commerciality	16 Jan. 2019
Oil-based	West Simunul (2 x 600 kW)	Commerciality	29 Jan. 2019
Oil-based	Pangapuyan (1 x 10 kW)	Commerciality	29 Jan. 2019
Oil-based	Ninoy Aquino DPP, Sultan Kudarat (2 x 500 kW)	Commerciality	29 Jan. 2019
Oil-based	Cagayan De Tawi-Tawi (Mapun), Tawi-Tawi (2 x 600 kW)	Commerciality	29 Jan. 2019
Oil-based	Tampakan Dampong DPP, Tawi-Tawi (1 x 150 kW)	Commerciality	29 Jan. 2019
Oil-based	Taganak Turtle Island DPP, Tawi-Tawi (1 x 150 kW)	Commerciality	29 Jan. 2019
Oil-based	Lugus Island, Sulu (1 x 150 kW)	Commerciality	29 Jan. 2019
Oil-based	Saluping Island DPP, Basilan (1 x 150 kW)	Commerciality	29 Jan. 2019
Oil-based	Tapiana Island DPP, Basilan (1 x 150 kW)	Commerciality	29 Jan. 2019

On the other hand, one private power provider, the DMCI Power Corporation has also been granted with a CEPNS for its 15-MW coal power plant project in Masbate.

Meanwhile, as CEPNS holders, NPC-SPUG and DMCI Power Corporation are entitled to the full benefits of EO30 that warrants a more accelerated timeframe to implement their proposed off-grid power generation projects.

- ***Conduct Policy Studies on Optimal Energy Mix for Off-grid Areas***

As part of its continuing advocacy to identify and establish the optimal energy mix for small islands and isolated grids, the DOE endeavors the formulation of a sound Missionary Electrification Development Plan (MEDP). Relative to this, the policy on optimal energy mix is embodied in the priority goals and objectives of the MEDP, in conjunction with DC2018-08-0024 or the "*Renewable Portfolio Standards for Off-Grid*". Currently, the DOE has on-going efforts focused on the

generation planning for the five island provinces namely, Mindoro, Palawan, Masbate, Marinduque and Romblon.

Along with this thrust, the DOE is assisted by the European Union – Access to Sustainable Energy Programme (EU-ASEP) in conducting studies and facilitating capacity building activities to help improve off-grid operations as part of the Programme's Technical Assistance (TA) component. Among the activities undertaken by DOE and ASEP in 2018 include the study to improve the efficiency of NPC-SPUG diesel power plants, and the training on the enhanced Simplified Planning Tool (SPT) for the optimization of supply mix.

- ***Rationalize and improve UCME Subsidy System***

As a key intervention to attain countryside development, off-grid areas are intensely supported by a subsidy mechanism through the UCME, which is being passed on to all electricity consumers. With the objective of easing power rates that burden all end-users, the rationalization of existing tariffs including the phase-out of the UCME subsidy mechanism is one of the salient provisions underscored in the Omnibus Guidelines for Off-Grid Areas.

In line with this, the DOE identified feasible measures to propel the rationalization of the UCME mechanism, which include: (a) tariff differentiation among customers and missionary areas; (b) methodology review for the determination of the True Cost Generation Rate (TCGR) and Subsidized Approved Generation Rate (SAGR) for the NPP Program; (c) methodology review for determination of the Full Cost Recovery Rate (FCRR) and Subsidized Approved Retail Rate (SARR) for the QTP Program; (d) provisional review of the cash generation-based incentive for RE Developers aligned with the context and objectives of UCME; and (e) interconnection of SPUG islands to the main grids of Luzon, Visayas and Mindanao or intra-connection among adjacent small islands not connected to the main grids.

- ***Performance Assessment and Benchmarking***

With the goal of improving small grid power system operations, the DOE has undertaken PAA activities in three off-grid areas in Luzon. These activities enabled the DOE to wholly assess the power situation including the operational efficiencies of the generation, transmission and distribution system facilities serving small islands and isolated grids.

During the conduct of PAA in MASELCO on 18-29 June 2018

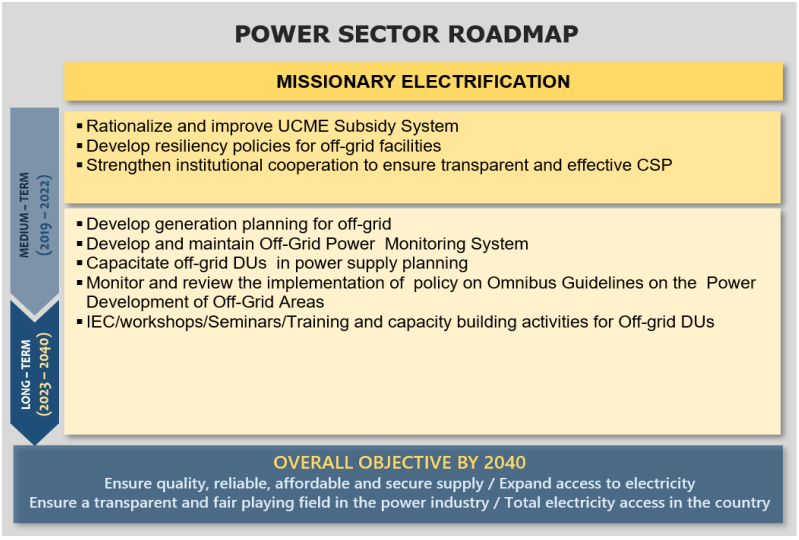
As a priority measure, the main results of the off-grid PAA were instrumental in the formulation of the Omnibus Guidelines for Off-Grid Areas that facilitated the establishment of benchmark data and information with respect to technical standards and operating guidelines of small grid systems.

Along with this initiative, the DOE piloted its first off-grid PAA in Oriental Mindoro Electric Cooperative, Inc. (ORMECO) in November 2017 followed by a post-audit activity which was conducted in the last quarter of 2018. Likewise, the DOE implemented the same undertaking in Masbate Electric Cooperative, Inc. (MASELCO) on 18-29 June 2018. On the other hand, the last off-grid PAA was carried out in the First Catanduanes Electric Cooperative, Inc. (FICELCO) held on 23-30 July 2018.

Meanwhile, as a continuing program of the Department, the results of future PAA activities will primarily serve as firm basis in identifying appropriate policy measures and programs to further improve the reliability, efficiency and modernization of off-grid power systems.

PLANS AND PROGRAMS

Figure 78. MISSIONARY ELECTRIFICATION ROADMAP



The issuance of the Omnibus Guidelines for Off-Grid Areas is a bold move of the Government in setting a clear track for power development in small islands and isolated grids and unviable areas. Now that the governing policy is already in place, the DOE concentrates on harmonizing efforts among energy agencies, including the stakeholders mandated with missionary electrification functions, to ensure the timely and effective implementation of the said policy within the medium- to long-term horizons.

At the early stage of the policy execution, the DOE prioritizes the rationalization and the enhancement of the UCME subsidy mechanism to cushion the potential and encumbering impacts to electricity users in off-grid areas. As an instrument of social justice, the UCME subsidy mechanism will be reviewed and reformulated to enable the marginalized consumers to afford the cost of electricity and use it efficiently.

Considering also that a number of off-grid islands are regularly stricken by calamities, the DOE pushes for resiliency policies to fortify existing and upcoming power facilities serving small island grids. Coherent with the DOE's energy resiliency thrust, this action plan also serves as a complementing strategy to ensure energy security in the off-grid areas.

And to address the pressing concern for a stable power supply in the small islands, the DOE strictly advocates for stronger institutional cooperation between NEA and NPC-SPUG towards the fulfilment of their sworn mandates. Essential in their mandates are the timely programming and delivery of respective plans, programs, and missionary electrification related projects in off-grid areas, among others. Likewise, full compliance to administrative and regulatory policies to include the fair and transparent execution of CSP for power supply sustainability needs to be efficiently enforced.

As a continuing program of the DOE, the MEDP is periodically formulated to embark on the generation and overall planning for off-grid areas. Along with this, the DOE undertakes various capacity building programs to boost the technical competencies of the DUs in off-grid with respect to power development planning. Relatedly, the DOE will develop and maintain a suitable off-grid power monitoring system, and work on the necessary improvements accordingly, and as the need arises.

In the long run, the DOE firmly monitors the implementation of the Omnibus Guidelines for Off-Grid Areas and conducts policy review to assess its applicability, consistency and relevance with the overall energy agenda of the DOE.

I. TOTAL ELECTRIFICATION PROGRAM

The government continues to put premium on the importance of expanding electricity access as this remains in the energy sector development agenda. Viewed as a tool that improves the quality of life of Filipinos, the sector is driven with the goal of attaining 100 percent electrification of unserved and underserved[93] areas in the country by 2022 based on 2015 Census of Population. The government has formulated the Total Electrification Program (TEP) with the main objective of providing electricity to all households by 2040.

With the President's directive to accelerate electrification by 2020, the Total Electrification Master Plan has been crafted under the TEP. As a concrete step, the Task Force E-Power Mo! (TFEM) was created by virtue of the Department Order (DO) No. 2018-05-0010 signed on 24 May 2018. The Task Force, chaired by the DOE, is responsible for overseeing the government's TEP and ensuring that electricity reaches the unserved and underserved communities within the franchise areas of DUs and ECs. The TFEM is also tasked to develop the National Unified Strategy for TEP based on the consolidated and reviewed comprehensive Total Electrification Master Plans of the individual DUs/ECs. The plan likewise pushes for increased private sector participation (PSP) specifically on areas where the DUs/ECs cannot perform their responsibilities.

The TFEM has identified three (3) major forms of electrification programs – *household electrification, grid electrification* and *off-grid electrification*. Household and grid electrification programs include the following strategies: a) the provision of house wiring subsidy for unenergized households situated in areas with distribution facilities such as DOE's Nationwide Intensification of Household Electrification (NIHE); b) extension of distribution line facilities to unserved areas such as NEA's Sitio Electrification Program (SEP) and the Barangay Line Enhancement Program (BLEP).

On the other hand, off-grid electrification programs include: a) DU's installation of individual photovoltaic – solar home systems (PV-SHS) under DOE and European Union's (EU) Access to Sustainable Energy Program (ASEP) PV Mainstreaming; b) implementation of mini/micro-grid system thru potential entry of private sector as Qualified Third Party (QTP), partner in a joint venture agreement (JVA), and the NPC-Small Power Utilities Group (SPUG) Mini-Grid Scheme.

The obligation of providing electricity service to areas throughout the country lie in the DUs. Electricity must be supplied in the least cost manner to its captive market subject to the collection of retail rate duly approved by ERC.[94] The provision of universal service by DUs also includes unviable areas and if there is no viable solution, these areas may be transferred to another DU (if any is available). The performance of DUs particularly its obligation in electrification of its franchise area overseen by NEA.

[93] Underserved area refers to those areas with less than 24-hour electricity service.
[94] Section 23 of RA 9136

The electrification solution is opened to QTPs if DUs are unable to serve the remote and unviable villages.[95] The DOE has the responsibility of declaring these remote and unviable areas that cannot be served by DUs. As support to the total electrification program and for an environment that is more conducive to private sector participation particularly in unviable areas, the DOE issued DC 2019-11-0015 or the Revised QTP Guidelines on 22 November 2019. The policy basically updates and revises the existing guidelines on QTP participation.

The NPC-SPUG's role in electrification comes when neither a DU nor QTP cannot provide electricity service in an area. It is responsible for providing power generation and its associated power delivery systems in areas that are not connected to the grid and cannot be serviced by DUs and other QTPs.[96]

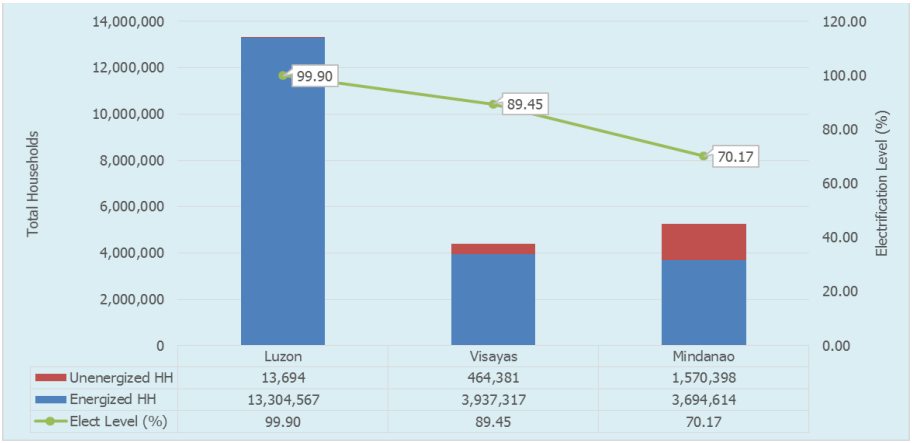
The short-term targets espoused in the TEP are as follows: a) process, evaluate and approve projects that contribute to the attainment of 90.0 percent household electrification by 2017 (based on 2010 Census[97]); b) monitoring of household electrification development plan (HEDP) programs; c) establish off-grid database management system; and d) develop proposal for NIHE Phase 2.

ASSESSMENT

1. *Process, Evaluate and Approve Projects that Contribute to the Attainment of Household Electrification Target by 2017*

The energy sector in the short-term was guided with the goal of attaining its household electrification target – that is 90.0 percent of the total households in the country have electricity access by 2017.

Figure 79. HOUSEHOLD (HH) ELECTRIFICATION, December 2017



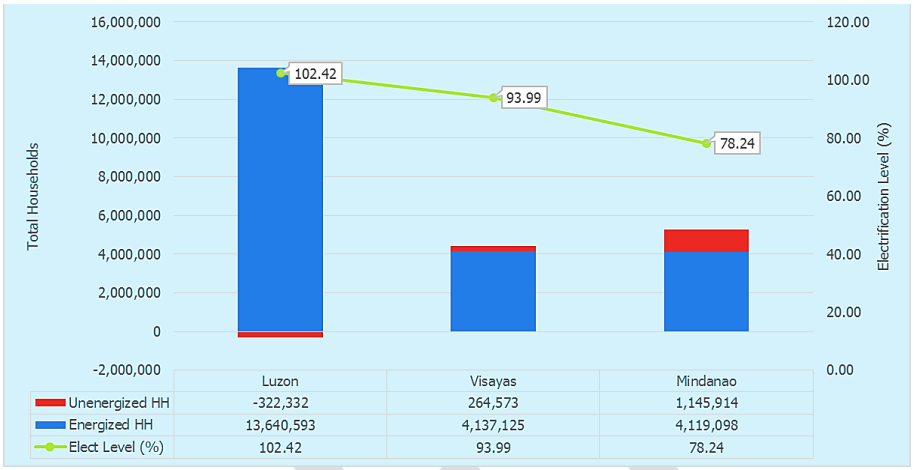
	Luzon	Visayas	Mindanao
Unenergized HH	13,694	464,381	1,570,398
Energized HH	13,304,567	3,937,317	3,694,614
Elect Level (%)	99.90	89.45	70.17

[95] Section 59 of RA 9136
[96] Rule 13 Section 3 of EPIRA-IRR
[97] The base year for the current electrification targets is based on the 2015 Census of Population (POPCEN 2015) of PSA

As early as December 2016, the DOE together with NEA has already reach the 90 percent household electrification level based on the 2010 Census of Population.

In December 2017, the country posted a household electrification level of 91.1 percent wherein a total of 20,936,498 households out of the potential 22,984,971[98] have access to electricity. This is translated to 2,048,473 households without electricity service throughout the country. Luzon registered the highest electrification level at 99.9 percent, while Visayas and Mindanao had 89.5 percent and 70.2 percent electrification levels, respectively (*Figure 79 and Table 49*).

Figure 80. HOUSEHOLD (HH) ELECTRIFICATION, December 2018



Note: Luzon recorded more than 100 percent household electrification level as the target household is based on 2015 Census of Population from PSA

Table 49. HOUSEHOLD (HH) ELECTRIFICATION, December 2017

	Total HH	Energized HH	Unenergized HH	Electrification Level (%)
Luzon	13,318,261	13,304,567	13,694	99.90
Visayas	4,401,698	3,937,317	464,381	89.45
Mindanao	5,265,012	3,694,614	1,570,398	70.17
Philippines	**22,984,971**	**20,936,498**	**2,048,473**	**91.09**

The country's electrification level improved by 4.0 percentage points in December 2018 at 95.3 percent. Of the total households[99], 21, 896,816 now have electricity, leaving only 1,088,155 without access to this basic service. Luzon is now 100 percent energized. Visayas' electricity level already reached 94.0 percent, while Mindanao still had the lowest at 78.2 percent (*Figure 80 and Table 50*)[100].

Table 50. HOUSEHOLD (HH) ELECTRIFICATION, December 2018

	Total HH	Energized HH	Unenergized HH	Electrification Level (%)
Luzon	13,318,261	13,640,593	-322,332	102.42
Visayas	4,401,698	4,137,125	264,573	93.99
Mindanao	5,265,012	4,119,098	1,145,914	78.24
Philippines	**22,984,971**	**21,896,816**	**1,088,155**	**95.27**

[98] Total potential households based on the 2015 Census of Population (POPCEN 2015).

[99] Total potential households based on the 2015 Census of Population (POPCEN 2015). The 2018 data reflected as of 15 May 2019. The DOE is still awaiting the submission of DUs/ECs of their DDP for 2019.

[100] Electrification level in December 2019 stood at 92.96 percent indicating that 23,229,866 households are with electricity service. The remaining 1,618,264 households without electricity are based on actual unserved households of DUs throughout the country. Electrification level on a per grid basis is as follows: Luzon (97.78 percent), Visayas (93.88 percent) and Mindanao (79.99 percent).

Shown in *Table 51* are the electrification projects, as approved by the DOE, contributing to expanding electricity access throughout the country. These projects include NIHE, Energy Regulations (ER) 1-94, PV mainstreaming – Government of Philippines (GOP) counterpart, PV Mainstreaming under the ASEP and QTP.

Table 51. ELECTRIFICATION PROGRAMS WITH APPROVED PROJECTS, 2018

Program Name	Program Description	No. of Approved Projects
Locally-Funded Project (LFP) – NIHE (2015 – 2018)	Provision of service connection is a grant subsidy amounting to PhP 3,750 per household which includes house wiring materials (at least two (2) bulbs and one (1) convenience outlet), service drop wire and kilowatt-hour meter.	78 projects (344,090 households)
ER 1-94	The provision of benefits to communities hosting generating facilities or energy resource development projects as stated in Section 5 (i) of RA 7638, Section 66 of RA 9136 and Rule 29 of the EPIRA-IRR. Utilization of 50% of the one centavo per kilowatt-hour (PhP 0.01/kWh) of the total electricity sales of all generation facilities as financial benefits (electrification fund).	57 projects (7 EF, 26 DLF and 24 RWMHEEF)
LFP - PVM (2017 – 2018)	Adopts a fee-for-service business model in which ECs install PV – solar home systems (SHS) in unelectrified households within its franchised area that are unviable for grid extension.	6 projects (9,984 households)
PVM – ASEP (2017 – 2018)	Adopts a fee-for-service business model in which ECs install PV – solar home systems (SHS) in unelectrified households within its franchised area that are unviable for grid extension. Funded by ASEP.	10,000 of 40,500 households in four provinces
QTP	Serves unviable and waived areas by DUs. Responsible for generation of power and its equivalent distribution.	6 sites endorsed to ERC with 1,342 households

2. *Develop Proposal for NIHE Phase 2*

Table 52. APPROVED NIHE PROJECTS, 2018

Electric Cooperative	No. of Households
ISECO	3,367
IFELCO	478
PANELCO III	6,636
MARELCO	4,118
ANTECO	3,122
ILECO III	3,886
ILECO II	7,651
LEYECO V	11,500
ANECO	2,177
MOELCI	1,344
MORESCO I	5,927
SURSECO I	9,296
ZAMSURECO	22,268
Total	**81,770**

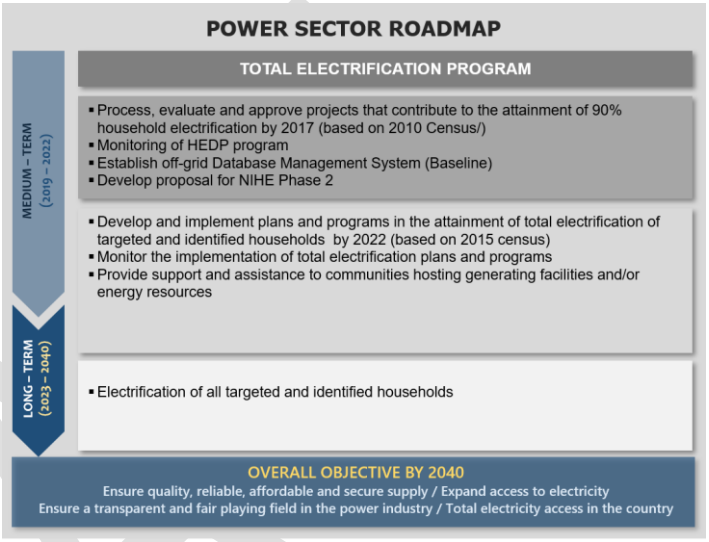
The NIHE program was implemented from 2015 to 2017. However, with the need to further expand the program, the DOE carried out a review and evaluation of its existing mechanism to further enhance and streamline the requirements. In the later part of 2017, the DOE issued the implementation guidelines that included the streamlined process in project approval, implementation and monitoring. In effect, approval was made to 13 out of the 18 projects under 2018 NIHE with a total beneficiary of 81,770 households. The ECs with approved projects are: Ilocos Sur Electric Cooperative (ISECO), Ifugao Electric Cooperative (IFELCO), Pangasinan III Electric Cooperative (PANELCO III), Marinduque Electric Cooperative (MARELCO), Antique Electric Cooperative (ANTECO), Iloilo III Electric Cooperative (ILECO III), Iloilo II Electric Cooperative (ILECO II), Leyte V Electric Cooperative (LEYECO V), Agusan del Norte Electric Cooperative (ANECO), Misamis Occidental Electric Cooperative (MOELCI), Misamis Oriental I Electric Cooperative (MORESCO I), Surigao del Sur I Electric Cooperative (SURSECO I), and Zamboanga del Sur I Electric Cooperative (ZAMSURECO I) (*Table 52*). These ECs have signed a Memorandum of Agreement (MOA) with the DOE for the project implementation within their franchise areas.

3. Policy Issuances

The targeted as well as identified beneficiaries in the underserved and unserved areas in the Government's electrification program are considered as consumers, given they have been provided with electricity service. Electrification's considerable impact to the people (would be consumers) is its ability to uplift living conditions and serve as a conduit for the delivery of basic services to those who have been deprived of electricity access.

Consumers who have electricity service are helping other consumers or would be consumers as a portion of the payment in electricity bills (the Universal Charge – Missionary Electrification) is utilized in subsidizing electricity in missionary or off-grid areas. Electrification is a program that enhances local development and transcends to every consumer.

Figure 81. ELECTRIFICATION ROADMAP



PLANS AND PROGRAMS

For the medium-term, the Total Electrification Program (TEP) has the objective of developing and implementing plans and programs in the attainment of total electrification of targeted households by 2022 (based on 2015 Census). In the long-term, it is envisioned that electricity service is provided to all households throughout the country. Continuing action plans will be pursued within the medium- to long-term period, which include: a) monitoring of implementation of total electrification plans and programs; and b) provision of support and assistance to communities hosting generating facilities and/or energy resources.

1. Development, Monitoring and Implementation of Total Electrification Plans and Programs

Cognizant of the total electrification target by 2022, the DOE is unwavering in the implementation of its identified electrification strategies in both grid and off-grid areas. This entails the management of the DOE approved projects and programs covering the following: a) TEP, in collaboration with NEA and NPC-SPUG, as the project implementer; b) PV Mainstreaming both by the DOE and EU-ASEP; c) Electrification Fund (EF) projects under ER 1-94 of the DUs; and d) QTP.

The TFEM continuously ensures that electricity access reaches communities that remain unserved and underserved by the DUs. Thus, the DUs are enjoined to execute their respective Total Electrification Masterplans outlining the appropriate electrification strategies and fund resources.

A pragmatic and timely approach in project implementation greatly contributes in attaining the objective of providing electricity access to the targeted households in the country.

2. *Provide support and assistance to Communities Hosting Generating Facilities and/or Energy Resources*

On ER 1-94[101], the DOE is on the standpoint to continue providing support and assistance to host communities from medium- to long-term period. It may be noted that in 2018, two pertinent policies on ER 1-94 were issued – the *DC. No. 2018-03-0005*[102] and *DC No. 2018-08-0021*[103]. The former, promulgated on 20 March 2018, recognizes the rights of indigenous cultural communities (ICCs) / indigenous peoples (IPs) in their ancestral domains to have equitable share from the financial benefits under ER 1-94. Meanwhile, the latter, promulgated on 23 August 2018, effects the transfer of financial benefits to the DUs/ECs and to host local government units (LGUs) and ICCs/IPs. The DC stipulates that the electrification Fund (EF) component will be remitted directly to the DUs/ECs, while the development and livelihood fund (DLF) and reforestation, watershed management, health and/or environment enhancement fund (RWMHEEF) will be remitted to the host LGUs and ICCs/IPs.

To guide the ICCs/IPs in availing their share, the DOE issued *DC No. 2019-06-0010*[104] on 14 June 2019 specifying the administrative operating guidelines (AOG) to facilitate the transfer and utilization of financial benefits by the ICCs/IPs whose ancestral domains are host to generation facilities and/or energy resources.

- ***ER 1-94 Status***

The ER 1-94 is a program that intends to recompense for the contribution made by communities hosting energy generating facilities and/or energy resources. The promulgation of DC 2018-08-0021 on August 2018 provided the guidelines on the direct remittance of financial benefit to host beneficiaries while DC 2019-06-0010 specified the AOG to facilitate the transfer and utilization of the funds.

Table 53. ER 1-94 Funds Remitted by DOE to Host LGUs (Sept 2019 - 12 August 2020)

Fund Type	Amount (Billion PhP)
EF	1.452
DLF	0.748
RWMHEEF	0.714
Total	**2.913**

As a means for Host LGUs to have additional fund source in addressing the COVID-19 pandemic, the DOE issued DC 2020-04-0008 entitled "Rationalizing the Utilization of ER 1-94 by LGUs in Response to COVID-19 Public Health Emergency" on 7 April 2020. The Circular stipulates that all available and unremitted ER 1-94 Funds (as of December 2019) that is with DOE and concerned power generation companies (GenCos) shall be immediately distributed to host LGUs in order to have a readily available fund for undertaking COVID-19 related responses. An Advisory was also issued last 14 July 2020 for the implementation of the DC and to provide clarification on particular sections as well as for the continuity of processes and activities.

For the period September 2019 to 12 August 2020, the DOE remitted a total of PhP 2.9 Billion of ER 1-94 funds to host LGUs with half of the remitted amount (50%) comprising the EF (*Table 53*).

[101] The provision of benefits to communities hosting generating facilities or energy resource development projects is stipulated in Section 5 (i) of RA 7638, Section 66 of RA 9136, and Rule 29 of the EPIRA-IRR.

[102] "Prescribing the Guidelines Recognizing the Rights of Indigenous Cultural Communities (ICCs) / Indigenous Peoples (IPs) in their Ancestral Domain and Access to the Financial Benefits as Host Communities under the ER 1-94 Program and Rule 29 (A) of the Implementing Rules and Regulations of Republic Act No. 9136 otherwise known as Electric Power Industry Reform Act of 2001"

[103] "Providing for the Amendments to Rule 29 Part (A) of the Implementing Rules and Regulations of RA 9136"

[104] "Prescribing the Administrative Operating Guidelines for the Availment and Utilization of Financial Benefits by the Indigenous Cultural Communities/Indigenous Peoples pursuant to DOE Department Circular No. 2018-03-0005"

J. INVESTMENT AND EMPLOYMENT OPPORTUNITIES

Investments on power sector must be highly promoted to ensure that power supply remains steadily available for the production and delivery of electricity to fuel economic growth. One important aspect for the future of power sector is the need to meet the necessary investment requirements for expansion of power generation capacity and development of required additional infrastructure to strengthen the existing power system.

The restructuring of the country's power sector paved the way for a more competitive electricity supply market as the government opened the opportunities of financing power projects to private investors. Considering that power projects are highly leveraged investment undertaking, building up substantial portfolios of investment in the sector should be of greater interest to encourage greater capital investments and private sector participation.

Table 54 shows the investment requirement in the generation sub-sector to support the expanding electricity demand. The estimated financing needs is slated for building new power plants to augment existing capacities and ensure adequate and reliable power supply. Under the BAU Scenario, the total capital investment needed to develop additional generation capacities amounts to PhP ____ million. With higher shares of renewables in the capacity addition, the CES is expected to be more expensive by __ percent, reaching PhP ___million due to high upfront cost in building more renewable power plants.

Table 54. INVESTMENT REQUIREMENTS FOR GENERATION PROJECTS (in Million Pesos)

	BAU		CES	
	Capacity	Investment Cost	Capacity	Investment Cost
Committed Power Plants				
Indicative Power Plants				
Capacity Addition				
Total				

Note: The list of committed and indicative power plants is summarized in Annexes _-_.

To increase the grid capacity and complement the entry of new generating facilities, the transmission sub-sector will need to invest PhP 893,700.34 million mostly comprised of upgrade and expansion of transmission backbones and development of island interconnections. Of total allocations, almost 60.0 percent is allotted to "Projects for Implementation" or those projects with target completion up to 2022 *(Table 55).*

Note that the investment for transmission development only pertains to projects up to 2025 since other future projects still need further assessment to estimate the total project cost for engineering, procurement, and construction.

Table 55. INVESTMENT REQUIREMENTS FOR TRANSMISSION PROJECTS (in Million Pesos)

	Luzon	Visayas	Mindanao	Total
Projects for Implementation	378,507.43	57,870.00	79,139.00	515,516.43
Proposed Projects up to 2025			49,660.91	378,183.91
Total	**598,839.43**	**166,061.00**	**128,799.91**	**893,700.34**

Note: The list of transmission projects is summarized in Annexes _-_, detailing the expected completion dates and investment cost.

For the benefit of the customers, increasing network efficiency and improving the performance of distribution services also necessitate large amounts of new investments to achieve long time reliability. *Table 56* enumerates the needed investments for distribution development projects planned to be implemented in the next ten years (2019-2028).

The estimated capital spending to further develop the country's distribution sector amounts to PhP821,127 million. More than half (54.2%) of total cost is allotted for electrification projects. This is followed by network projects taking 40.0 percent (Php 328,553 million) mostly consist of additional substation and sub-transmission facilities and upgrading and rehabilitation of the existing distribution system. The remainder is shared out to non-network projects which range from acquisition of property, equipment, safety gadgets, software, vehicles, and others that assist electric cooperatives in its operations and delivery of services.

Table 56. INVESTMENT REQUIREMENTS FOR DISTRIBUTION PROJECTS (in Million Pesos)

Capital Expenditures	Luzon	Visayas	Mindanao	Total
Network Assets	**253,590**	**25,180**	**49,782**	**328,553**
Sub-transmission Facilities	*13,208*	*1317*	*7631*	*22,155*
Distribution Facilities	*147,123*	*9460*	*14978*	*171,562*
Substation Capacities	*50,661*	*3689*	*10221*	*64,570*
Other Network Assets	*42,599*	*10714*	*16953*	*70,266*
Non-Network Assets	**32,120**	**4161**	**11487**	**47,768**
Electrification Projects	**148,170**	**1855**	**294782**	**444,807**
Total	**433,880**	**31,196**	**356,051**	**821,127**

It is understood that investments on the power sector have been instrumental on the stability and growth of the country's economy as it stimulates potential job creations related to construction and operation of power sector infrastructure or services. Moreover, it is important to notice that power sector's skilled workforce generally have higher level of incomes thus contributing more absolute spending per capita to the economy. Such only implies how the employment in power sector influences economic growth.

As shown in *Table 57,* the total potential employment associated with power sector investments is approximately _____ for the BAU scenario. However, a shift to the CES would create an additional ____ jobs in comparison to BAU. Since CES has more capacity additions due to high share of renewables, the required workforce will considerably increase especially during the construction and installation phases. Furthermore, renewable energy technologies tend to be more labor intensive as revealed by several available literatures.

Table 57. ESTIMATED JOB GENERATION

Sub-sector	Job Generation	
	BAU	CES
Generation		
Committed Power Plants		
Indicative Power Plants		
Capacity Addition		
Transmission		
Projects for Implementation		
Proposed Projects up to 2025		
Distribution		
Total		

The employment opportunities within the sector is of considerable significance for a developing country like the Philippines in order to achieve substantial economic gains and consequently,

advance the living standards of its people. Given that these employments could further create more additional jobs as income expands, it must be noted that the job generation presented only reflects the estimated number of direct jobs for the pre-development, construction, and operation and maintenance activities.