Energy Storage System in the Philippine Electric Power Industry

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Department of Energy

A Flexible and Distributed Power System: Storage, Grids and Interconnection
Asian Development Bank Auditorium Hall 2
6 June 2025

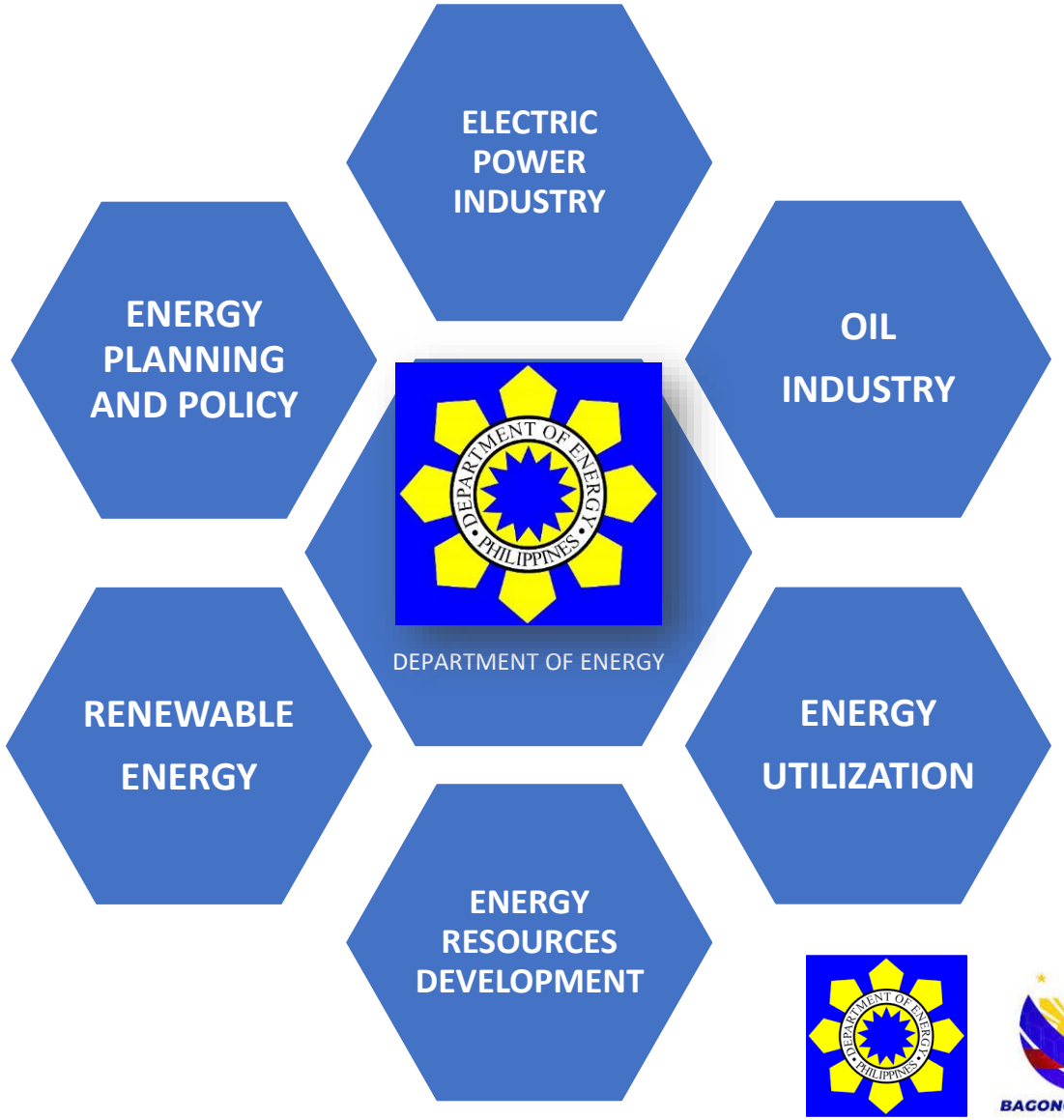
BAGONG PILIPINAS

OUTLINE

1. About the Department of Energy
2. Overview of the Power Sector
3. Policies supporting ESS
4. Philippine Energy Plan

About the Department of Energy

Prepare, integrate, coordinate, supervise and control all **plans, programs, projects and activities** of the government relative to **energy exploration, development, utilization, distribution and conservation**



About the Department of Energy

Mandate

The DOE is mandated to oversee all government energy-related activities, including exploration, development, utilization, distribution, and conservation.

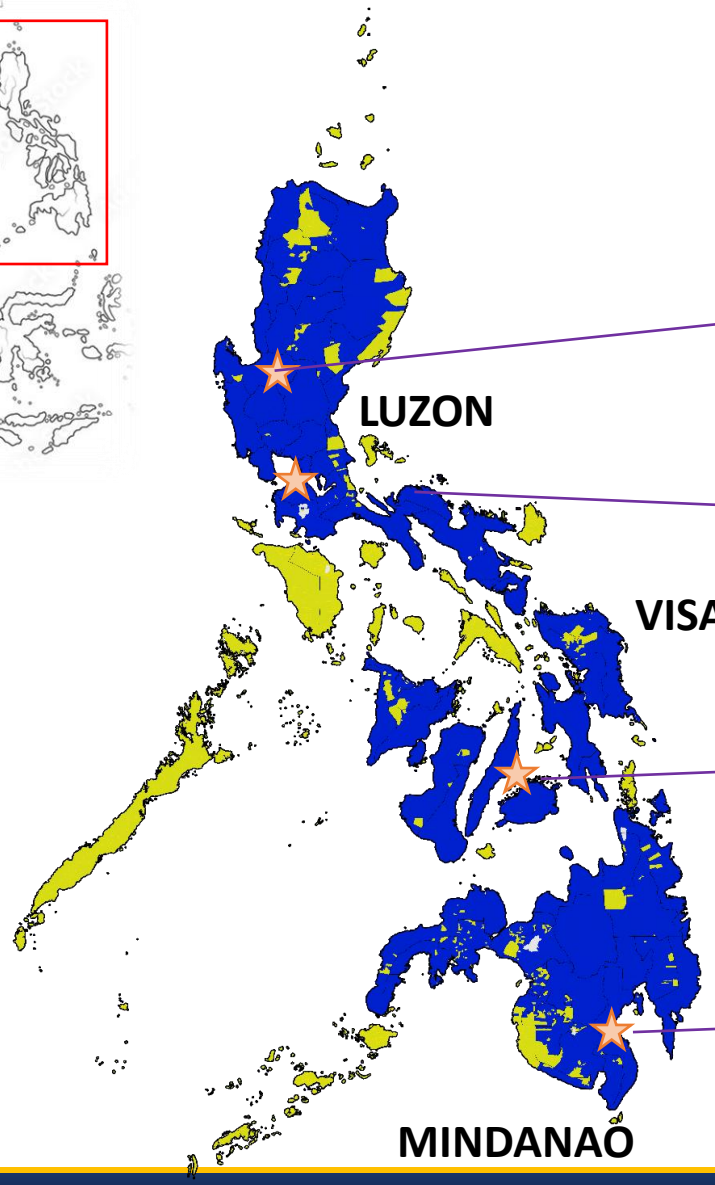
Mission

The DOE aims to enhance the quality of life for Filipinos by ensuring sustainable, stable, secure, and affordable energy through effective policies and programs in collaboration with stakeholders.

Vision

The DOE envisions being globally competitive, providing clean, efficient, and sustainable energy systems that drive industrial growth and improve lives for current and future generations.

About the Department of Energy



Luzon Field Office:
Urdaneta, Pangasinan

Main Office:
BGC, Taguig City, Metro Manila

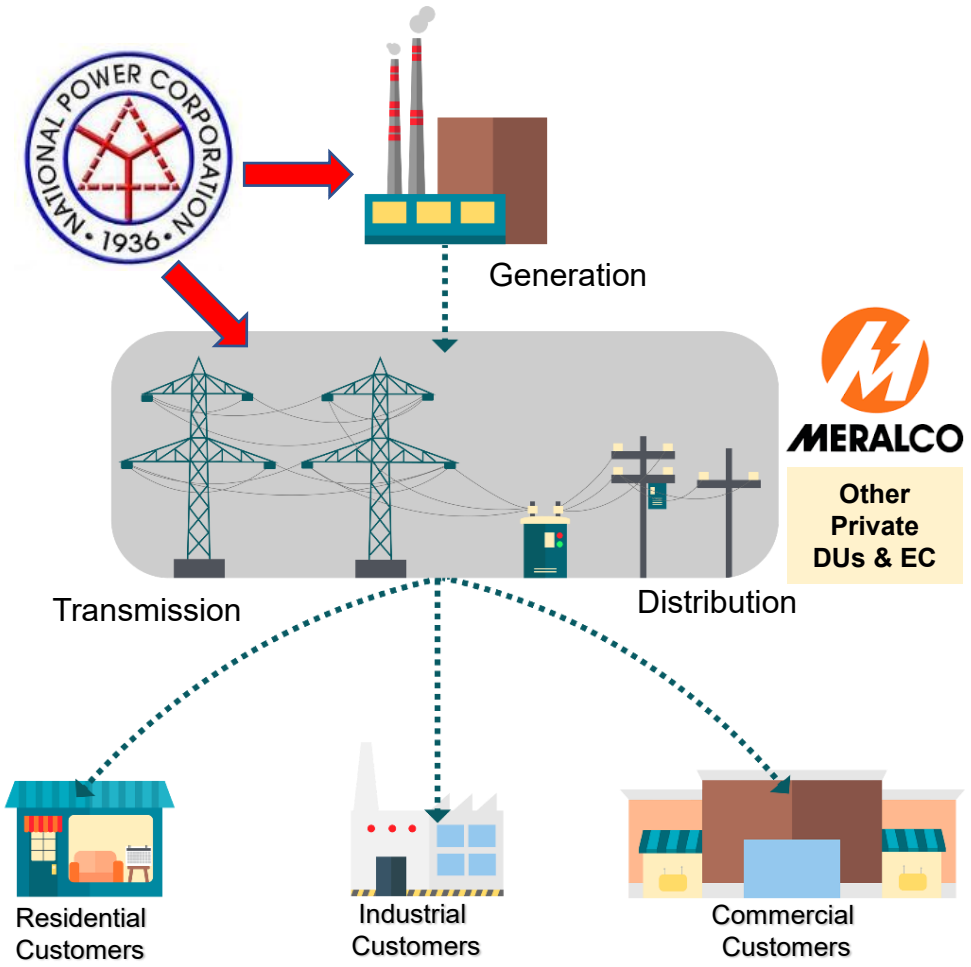
Visayas Field Office:
Cebu City, Cebu

Mindanao Field Office:
Davao City

BAGONG PILIPINAS

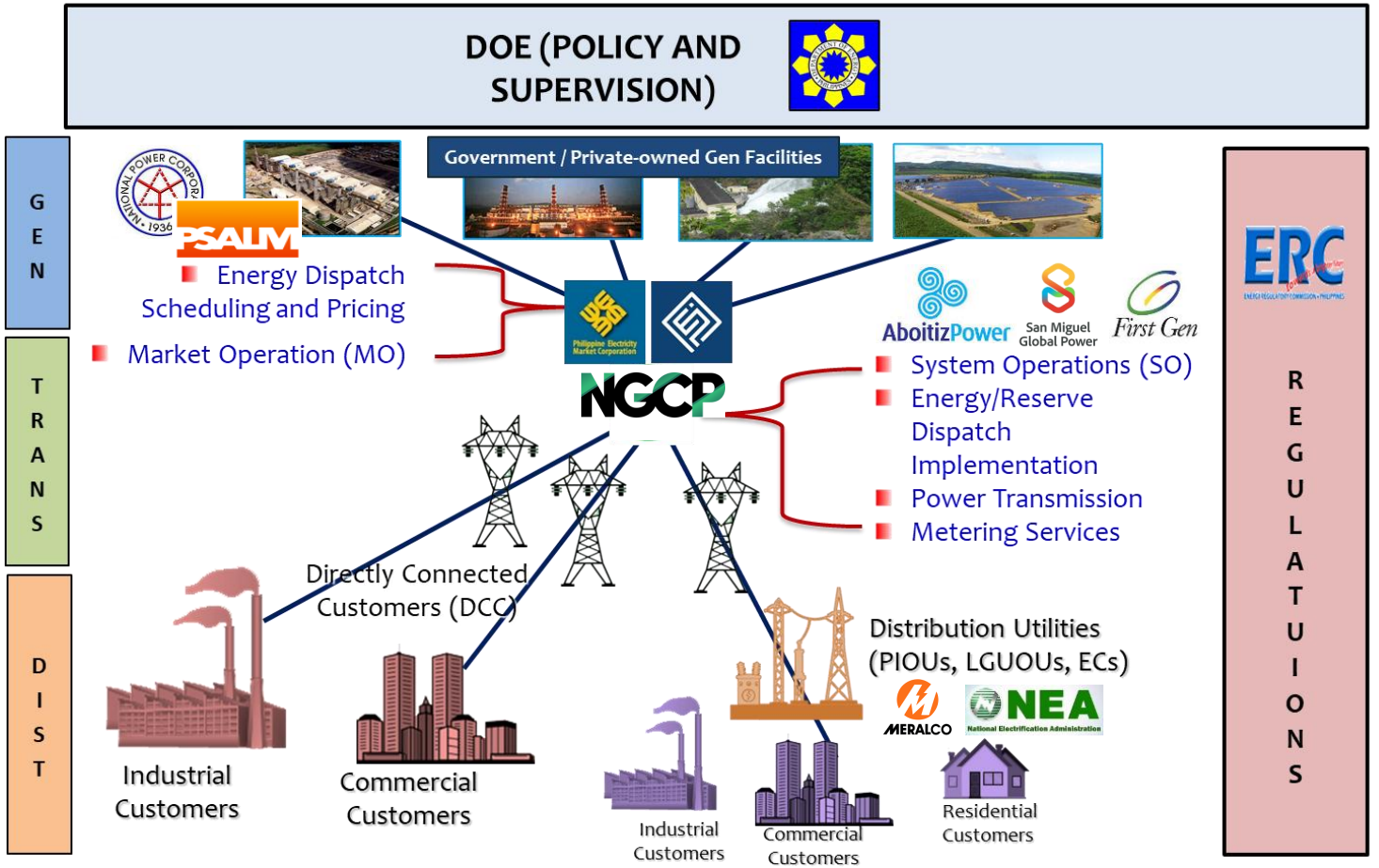
OVERVIEW OF POWER SECTOR RESTRUCTURING

PRE-EPIRA (PRIOR 2001)



RA 9136: EPIRA (2001-PRESENT)

Power Sector Institutional Framework

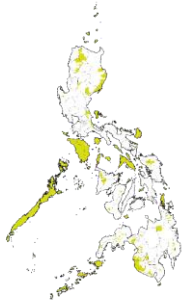


Source: *DOE EPIMB*

OVERVIEW OF POWER SECTOR RESTRUCTURING

POWER SYSTEM ILLUSTRATION

OFF-GRID



GENERATION SECTOR

Generation Companies

San Miguel Global Power

First Gen

AboitizPower

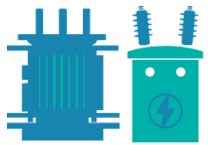
TRANSMISSION SECTOR

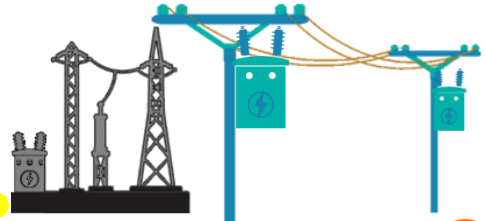
NGCP

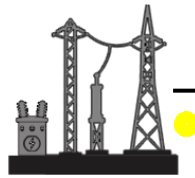
National Grid Corporation of the Philippines (NGCP)

- Transmission Network Provider and System Operator

DISTRIBUTION SECTOR







Distribution Utilities

- Private Investor-Owned Utilities

MERALCO

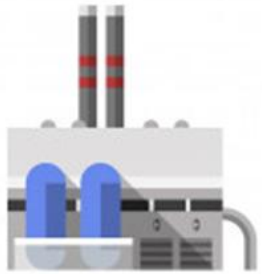
davao light

visayan electric

- Electric Cooperatives

CONSUMERS / END-USERS / LOAD

Commercial



Industrial

Residential

Source: *DOE EPIMB*
Image Sources: *Google, Canva*

ENERGY REGULATORY COMMISSION

AT A GLANCE
PHILIPPINE ENERGY SECTOR

94.75%
Household Electrification Rate (Source: DUs' Monthly Report to DOE, Dec 2024)

PhP 3.3-TRILLION INDUSTRY

251 Generation Companies
616 Generation Facilities
Equivalent to
30,383.06 MW
319 On-Grid
297 Off-Grid

1 Transmission Concessionaire
21,027 Circuit Kilometers of Transmission Lines
48,801 MVA Sub-station Capacity
P357.7 B Total Equity

487 WESM Participants
288 intervals per day in five-minute market

142 Distribution Utilities
P337.07 B net property in service of electric cooperatives and capital stocks of private distribution utilities

153 Retail Electricity Suppliers
49 Suppliers of Last Resort
29 Local RES
56 RES

PhP28 to PhP31 TRILLION
TOTAL INVESTMENT REQUIREMENT

under the clean energy scenario in Philippine Energy Plan 2023-2050 which translates to

2.17 to 2.49
JOB OPPORTUNITIES FOR FILIPINOS

Source: DOE PEP 2023-2050

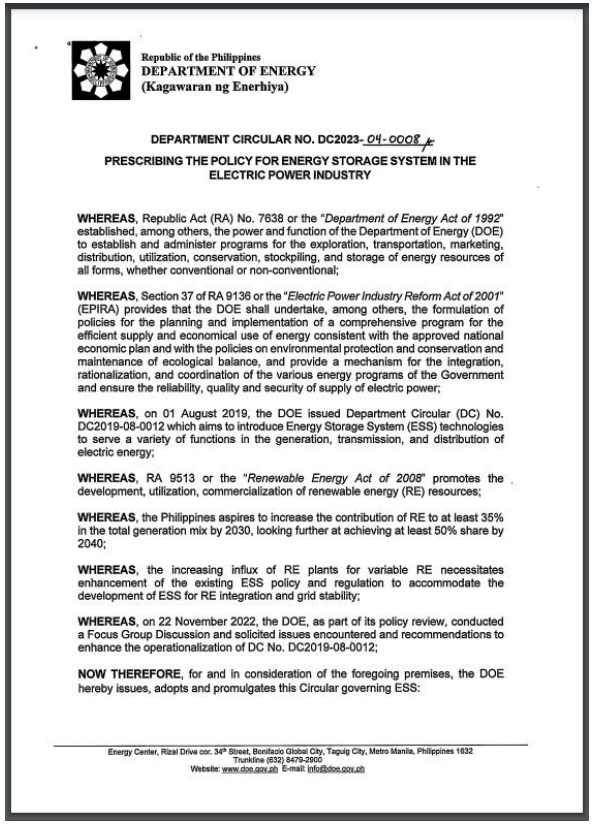
Source: ERC and DOE data as of March 2025

POLICIES Supporting Energy Storage Systems (ESSs)

- **Department Circular No. 2020-02-0003, "Providing a National Smart Grid Policy Framework for the Philippine Electric Power Industry and Roadmap for Distribution Utilities"**
  - ✓Recognizes ESS as a vital component of the Smart Grid system.

- **Department Circular No. 2023-04-0008, "Prescribing the Policy for Energy Storage System in the Electric Power Industry"**
  - ✓Adoption and promotion of ESS in the country
  - ✓Identifies various purposes of ESS
  - ✓Permitting, Licensing, Connection and Operational Requirements

- **Department Circular No. DC2024-09-0028, "Prescribing Amendments to Department Circular No. DC2023-10-0029 titled "Providing Specific Auction Policy and Guidelines for Non-Fit-Eligible Renewable Energy Technologies in the Green Energy Auction Program"**
  - ✓Policy supporting the inclusion of PSH Facilities in the GEA rounds



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

DEPARTMENT CIRCULAR NO. DC2023-04-0008

PRESCRIBING THE POLICY FOR ENERGY STORAGE SYSTEM IN THE ELECTRIC POWER INDUSTRY

WHEREAS, Republic Act (RA) No. 7638 or the "*Department of Energy Act of 1992*" established, among others, the power and function of the Department of Energy (DOE) to establish and administer programs for the exploration, transportation, marketing, distribution, utilization, conservation, stockpiling, and storage of energy resources of all forms, whether conventional or non-conventional;

WHEREAS, Section 37 of RA 9136 or the "*Electric Power Industry Reform Act of 2001*" (EPIRA) provides that the DOE shall undertake, among others, the formulation of policies for the planning and implementation of a comprehensive program for the efficient supply and economical use of energy consistent with the approved national economic plan and with the policies on environmental protection and conservation and maintenance of ecological balance, and provide a mechanism for the integration, rationalization, and coordination of the various energy programs of the Government and ensure the reliability, quality and security of supply of electric power;

WHEREAS, on 01 August 2019, the DOE issued Department Circular (DC) No. DC2019-08-0012 which aims to introduce Energy Storage System (ESS) technologies to serve a variety of functions in the generation, transmission, and distribution of electric energy;

WHEREAS, RA 9513 or the "*Renewable Energy Act of 2008*" promotes the development, utilization, commercialization of renewable energy (RE) resources;

WHEREAS, the Philippines aspires to increase the contribution of RE to at least 35% in the total generation mix by 2030, looking further at achieving at least 50% share by 2040;

WHEREAS, the increasing influx of RE plants for variable RE necessitates enhancement of the existing ESS policy and regulation to accommodate the development of ESS for RE integration and grid stability;

WHEREAS, on 22 November 2022, the DOE, as part of its policy review, conducted a Focus Group Discussion and solicited issues encountered and recommendations to enhance the operationalization of DC No. DC2019-08-0012;

NOW THEREFORE, for and in consideration of the foregoing premises, the DOE hereby issues, adopts and promulgates this Circular governing ESS:

Energy Center, Rizal Drive cor. 34th Street, Bonifacio Global City, Taguig City, Metro Manila, Philippines 1632
Trunkline (632) 8479-2900
Website: www.doe.gov.ph E-mail: info@doe.gov.ph

Salient Features of the ESS Policy

DEFINITION

A facility capable of absorbing energy directly from the Grid or Distribution System, or from an RE Plant or from a Conventional Plant connected to the Grid or Distribution System and storing it for a time period, and injecting stored energy when prompted, needed to ensure reliability and balanced power system

USES OF ESS

- Ancillary Services
- Energy through bilateral contracts or trading in the WESM
- Manage the variability of Renewable Energy
- Auxiliary Load Management for Generation Companies
- Transmission and Distribution Facility Upgrades Deferment
- Transmission and Distribution Power Quality Management
- Distribution Utility Demand Management
- End-User Demand Management

Salient Features of the ESS Policy

ESS in Energy Transition

By allowing an increased integration of ESS to the Grid and/or with VREs, the policy envisioned to allow more penetration of VREs while ensuring reliable supply.

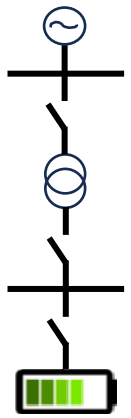
As the industry continuous to evolve, the DOE is looking in the possibility to supplement the policy to allow Grid-Forming Inverters and revision of the Grid Code to include Inverter-based resources.

Salient Features of the ESS Policy

ESS Category, and Connections

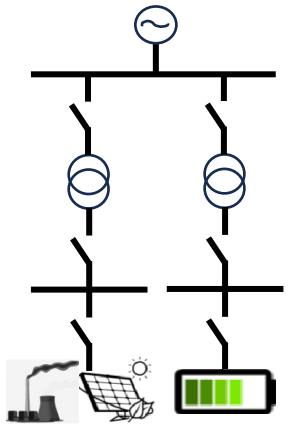
Stand Alone ESS

- Connected either to the Grid or Distribution System



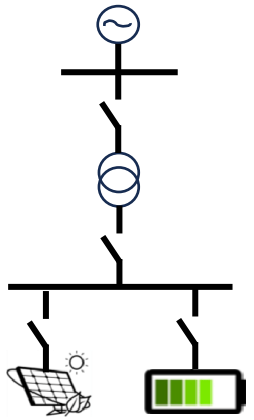
Generating Plant and ESS

- ESS is connected to the Generating Plant/s and can be charged from the Generating Plant/s or from the Grid or Distribution System



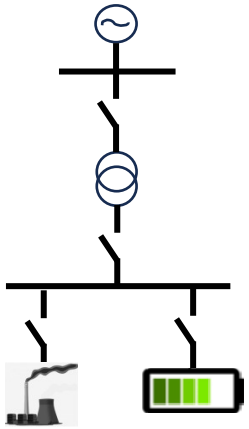
Integrated RE and ESS

- ESS is only connected to the RE Plants/s



Integrated Non-RE and ESS

- ESS is only connected to the Conventional Plants/s



Salient Features of the ESS Policy

Permitting and Licensing Requirements

Stand Alone ESS

- Shall secure a COC-ESS from the ERC

Generating Plant and ESS

- Shall secure a separate COC and COC-ESS for each facility

Integrated RE and ESS

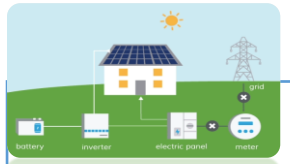
- Shall secure for a single COC only

Integrated Non-RE and ESS

- Shall secure for a single COC only

Salient Features of the ESS Policy

Identified ESS technologies shall include, but not limited to the following



Battery Energy Storage System (BESS)

Compressed Air Energy Storage (CAES)

Flywheel Energy Storage (FES)

Pumped-Storage Hydropower (PSH)

Permitting Requirements

The passage of **Republic Act No. 11234**, entitled ***"Energy Virtual One-Stop Shop (EVOSS) Act"*** on 08 March 2019 paved the way for streamlining and expediting the permitting process for energy projects in the Philippines.

- **If ESS Project is under Indicative Status:**

  1. Clearance to Undertake System Impact Study with National Grid Corporation of the Philippines
  2. Certificate of Endorsement for Point-To-Point (P2P) Limited Transmission
  3. Letter of Endorsement to NCIP for Transmission Projects
  4. Letter of Endorsement to NCIP for Generation Projects
  5. Letter of Endorsement to PNP for Specific purpose of the purchase/possession of the explosives/explosive ingredients/ controlled chemicals

- **If ESS Project is under Committed Status:**

  1. Certificate of Endorsement to Energy Regulatory Commission
  2. Certificate of Endorsement to Board of Incentives

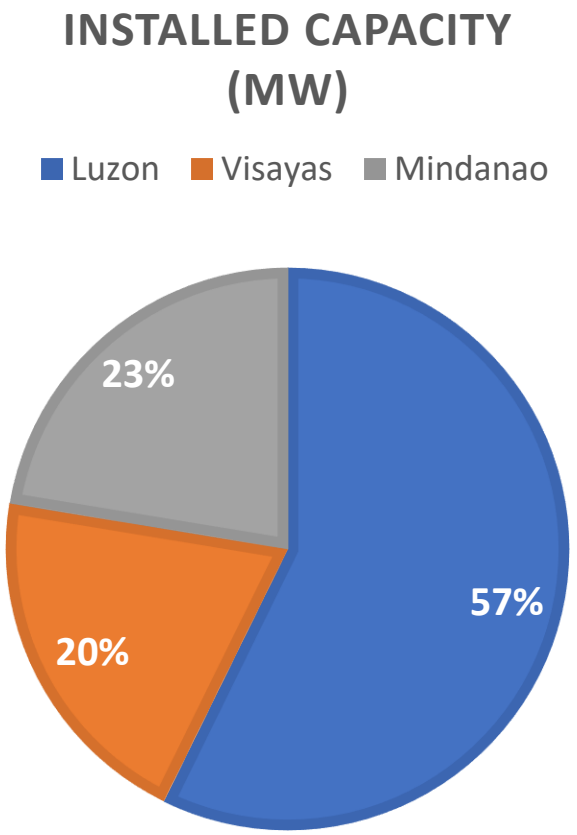
Further, the BESS Projects may also apply for the DOE's Endorsement pursuant to **Department Order No. DO2024-04-0003**, entitled ***"Prescribing the Policy Framework and Guidelines for the Processing of Applications for Certificate of Energy Projects of National Significance"*** for permits not included in the EVOSS website.

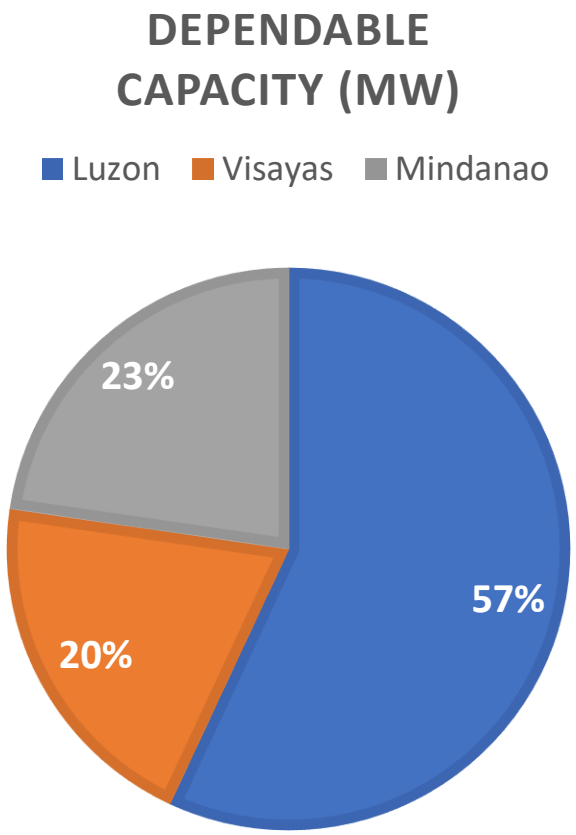
Existing ESS Projects

A. Existing Battery Energy Storage System

Particulars	Installed Capacity (MW)	Dependable Capacity (MW)
Luzon	363	341
Visayas	129	122
Mindanao	142	136
Philippines	634	599

Source: DOE List of Existing Power Plants as of March 2025

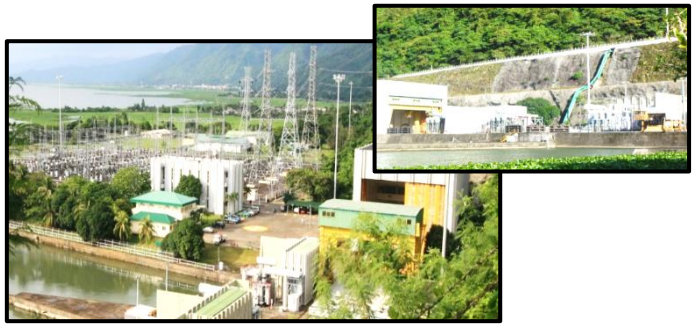




Existing ESS Projects

Kalayaan Pumped HydroStorage Power Plant

Is considered as an Energy Storage System (ESS) as it uses electric energy to store energy at night, wherein the demand is low, and then generating energy during daytime peak period.



Masinloc Battery Energy Storage

10 MW Masinloc Battery Energy Storage, which intends to provide Ancillary Service;

SREC Battery Energy Storage

A hybrid power plant with a microgrid to provide power to Sitio Sabang, Barangay Cabayugan

Existing ESS Projects

Kabankalan Battery Energy Storage

Kabankalan BESS is the first operational energy storage asset on the Visayas regional grid.

Lamao BESS

The first of the 32 Projects of San Miguel Power Global Corporation positioned strategically all over the Philippines

Therma Marine Inc (Maco, Davao)

The first BESS Project of TMI that would help in ensuring grid stability in Mindanao through sufficient Ancillary Services

PHILIPPINE ENERGY PLAN 2023 -2050

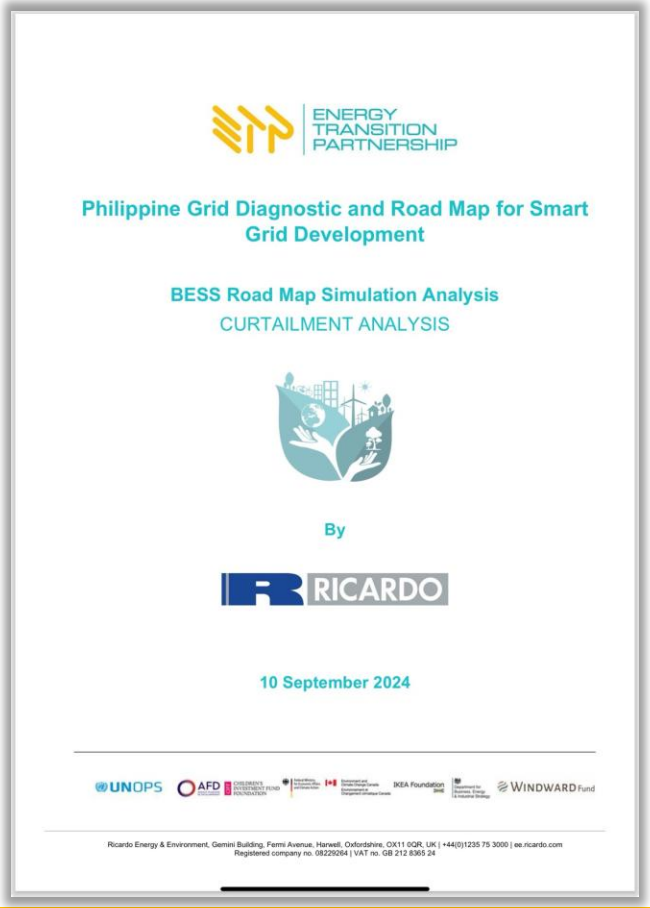
REFERENCE	• 35% RE share in power generation mix by 2030 • 50% RE by 2040-2050
CLEAN ENERGY 1 (High RE with low OSW + Nuclear + Coal Repurposing)	• 35% RE share by 2030, 50% RE by 2040, more than 50% by 2050 • Coal repurposing • Nuclear capacity of 1,200 MW by 2032, 2,400 MW by 2035 and 4,800 MW by 2050 • 19 GW of OSW by 2050
CLEAN ENERGY 2 (High RE with high OSW + Nuclear + Coal Repurposing)	• 35% RE share by 2030, 50% RE by 2040, more than 50% by 2050 • Coal repurposing • Nuclear capacity of 1,200 MW by 2032, 2,400 MW by 2035 and 4,800 MW by 2050 • 50 GW of OSW by 2050

TECHNICAL ASSISTANCE TO SUPPORT THE TARGETS

- **Philippines Grid Diagnostic and Roadmap for Smart Grid Development**
  - ✓This concluded TA which tapped the Ricardo Energy and Environment has been an instrumental component and reference for the conduct of the 4th round of Green Energy Auction Program, specifically, on the Integrated Solar and ESS.

- **Accelerating Clean Energy Scenarios (ACES)**
  - ✓Currently, the consultants – Intelligent Energy Systems for PLEXOS and PTERRA for PSSE are conducting technical sessions and capacity building for the DOE to achieve CES.

- **Pumped Storage Hydro (PSH) Viability Assessment and Development Framework**
  - ✓Seeks to assess and advance PSH as a stand-alone ESS to support the country's renewable energy and grid stability goals through site identification, market assessment, and development of a comprehensive framework to guide PSH project development



Five Energy Transition Strategies

- **Accelerate RE Development** with a special focus on offshore wind (OSW)
- **Smart and green transmission system** to accommodate additional RE capacity expected to come online from 2024 to 2040
- Build **port infrastructure** to support OSW and other marine-based energy resource development projects
- **Voluntary early decommissioning and/or repurposing of existing coal-fired power plants (CFPPs)**
- **Energy Efficiency and Conservation**

FUTURE ENERGY SCENARIO

EEC

10% energy savings on oil products and electricity by 2040 up to 2050

+

RE

35% of power generation mix by 2030, 50% by 2040, and more than 50% by 2050

+

EMERGING TECHNOLOGIES

50% EV penetration rate in road transport by 2040; Explore alternative technologies (e.g. nuclear, hydrogen, ammonia)

+

ICT

Adopt advanced and smart grid technologies

+

ENERGY RESILIENCY

Resilient and climate-proof energy infrastructure

PH Contribution to Global Energy Transition:

Offshore Wind Development and Support Port Infrastructure | Marine-based Energy Resource Development | Rightskilling of Filipino Workforce & International Accreditation Initiative | Mining and Manufacturing of Green Materials | Voluntary Retirement and Repurposing of CFPPs

End of Presentation

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