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# **Presentation Outline**



The Need for Battery Electricity Storage in the Philippines



Reporting Methodology



Battery Electricity Storage Technologies in the Philippines



Challenges in Implementing Battery Electricity Storage in the Philippines



Conclusion

## The Need for Battery Electricity Storage in the Philippines (Key Points)

•The Philippines is a country with high solar and wind potential.

The Philippines' energy grid is aging and unreliable.

The Philippines is committed to reducing its greenhouse gas emissions.

 Battery storage is a cost-effective way to improve the reliability and efficiency of the energy grid.

## **Committed and Indicative Capacities in the Philippines**

Fuel Type	Committed			Indicative	
	Installed / Rated Capacity (MW)		% Share	Installed / Rated Capacity (MW)	% Share
Coal	4,488	.40	50.24%	1,520.00	3.15%
Oil-Based	41	.75	0.47%	335.20	0.69%
Natural Gas	3,500	.00	39.17%	6,588.00	13.65%
Renewable Energy (RE)	904	.53	10.12%	39,803.76	82.50%
Geothermal	129	.00	1.44%	274.00	0.57%
Hydro	274	.51	3.07%	7,958.00	16.49%
Biomass	60	.60	0.68%	104.00	0.22%
Solar	440	.42	4.93%	13,970.88	28.96%
Wind	0	.00	0.00%	17,496.80	36.27%
TOTAL	8,934	.68	100.00%	48,246.96	100.00%
ENERGY STORAGE SYSTEM (ESS)	<mark>2,139</mark>	<mark>.13</mark>		<mark>2,041.95</mark>	
BATTERY ESS	<mark>2,090</mark>	.13		<mark>2,041.95</mark>	
HYBRID ESS (DIESEL-BATTERY SYSTEM)	49	.00			

## Market participation and ESS installation types

Pacia Paguiramento	Installation Type			
Dasic Requirements	Stand-alone	Hybrid		
ERC – ownership and COC licensing	Energy Storage System Operator	Generator		
Asset Boundary/Connection Point Agreement	Connected to the Grid	Connected to Grid thru a generating plant		
WESM Market Resource Classification	Energy Storage System	Generator		
Market Participation	Load; Supply of energy and reserve	Supply of energy and reserve		

# **Reporting Methodology**

• **Data collection:** This will specify the data that should be collected on battery storage systems. This data will include the capacity of the system, its location, its use, and its technical specifications.

• **Data reporting:** The methodology will specify how the data on battery storage systems should be reported. This could include a centralized reporting system or a decentralized system where data is reported to different agencies.

• **Data analysis:** The methodology will specify how the data on battery storage systems should be analyzed. This could include analysis of the trends in battery storage deployment, the benefits of battery storage, and the challenges to battery storage deployment.

# **Registration of BESS Projects in the WESM**

Region	Total Installed Capacity (MW)	Total No. of Projects	
Luzon	1480.00	44	
Visayas	310.125	16	
Mindanao	280	12	

# **Bids and Offer Submission**

• Each Generation Company including Generation Companies with bilateral contracts shall submit a standing market offer for each of its scheduled generating units, battery energy storage systems and pumpedstorage units for each dispatch interval in each trading day of the week in accordance with the timetable.

• The standing market offer shall apply until revised or updated by the Generation Company.

• Generation companies may then submit a revised offer for any dispatch interval of the current week-ahead horizon in accordance with the timetable and subject to Clause 3.5.11.4 of the WESM Rules.

# **Bids and Offer Submission**

- Hybrid ESS registered as Generator shall submit supply offer for energy or reserve.
- A registered ESS Operator who does not intend on exercising demand bid should submit load forecast data.
  - Price response accuracy problems may arise in load forecasting if an ESS Operator without demand bid responds unilaterally to spot price and deviates from submitted forecasts.

## **Battery Electricity Storage Technologies in the Philippines**

#### • Lithium-ion batteries

• Used in many products such as electronics, cellphones, wireless headphones, handheld power tool.



#### • Lead-acid batteries

- They are used to start cars, trucks, and other vehicles.
- Also used as UPS or uninterruptible power supply (UPS) to provide back up power in case of power outages.





 The main difference between flow batteries and other rechargeable battery types is that the aqueous electrolyte solution usually found in other batteries is not stored in the cells around the positive electrode and negative electrode

# **BATTERY STORAGE SYSTEMS in the PHILIPPINES**

Here are some of the battery storage systems in the Philippines:

- San Miguel Corporation's Masinloc Battery Energy Storage System (BESS)
- Aboitiz Power Corporation's 49-megawatt (MW) battery energy storage system (BESS)

## **BESS** Power Plants in the Philippines

POWER PLANT		CAPACITY, MW		NUMBER OF UNITS
FACILITY NAME	SUBTYPE	INSTALLED	DEPENDABLE	
ALAMINOS BESS	BESS	60.0	60.0	24
MASINLOC BESS	BESS	12.4	12.4	1
KABANKALAN BESS	Lithium-Ion Battery Energy Storage System	22.5	22.5	3
KABANKALAN PH2 BESS	Lithium-Ion Battery Energy Storage System	12.2	12.2	
TMI Hybrid Diesel-Battery System	Hybrid (Diesel-Battery System)	49.0	49.0	
Total		156.1	156.1	28.0

San Miguel Corporation's Masinloc Battery Energy Storage System (BESS)

Location: Negros Occidental





Aboitiz Power Corporation's 49megawatt (MW) battery energy storage system (BESS)

Location: Maco, Davao de Oro



#### **Challenges in Implementing Battery Electricity Storage in the Philippines**

• High Cost: the upfront cost of battery storage systems is relatively high

• Lack of standardization: There is no currently no standard for battery systems in the Philippines.

• Environmental concerns: Some people have raised concerns about the environmental impact of battery storage systems, particularly those that use lithium-ion batteries.

• Regulatory Uncertainty: The regulatory environment for battery storage systems in the Philippines is still evolving, which can create uncertainty for investors and developers.



### **Government Policies**

• ADOPTION OF ENERGY STORAGE SYSTEM IN THE ELECTRIC POWER

**Department Circular No. DC2023-04-0008,** Prescribing the Policy for Energy Storage System in the Electric Power Industry.



## **Government Policies**

Other Related Policies:

- RA No. 9513 or the RE act of 2008
- The Renewable Portfolio Standard (RPS)
  - requires electric power suppliers to source a certain percentage of their electricity from renewable energy sources
- The Green Energy Option Program (GEOP)
  - allows consumers to choose to purchase their electricity from renewable energy sources
- The Wholesale Electricity Spot Market (WESM)

- allows buyers and sellers of electricity to trade electricity on a competitive basis.

# Conclusion

In conclusion, we have seen that battery electricity storage is a crucial technology for the Philippines. With its current energy infrastructure facing challenges such as high costs and unreliable power supply, battery storage provides a reliable and cost-effective solution. We have discussed the different technologies being used in the country and the challenges faced in implementing them. However, with the right support and investment, battery electricity storage can help transform the energy landscape of the Philippines and provide a sustainable future for generations to come.



# **Thank You!**

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Rizal Drive Corner 34<sup>th</sup> Street Bonifacio Global City Taguig City

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