

Distributed Energy Resource (DER) as a **Diversification Strategy** for Southeast Asia Nomura Research Institute Singapore Pte. Ltd







Introduction





What You Will Take Away from This White Paper

In this white paper, Nomura Research Institute (NRI) aims to provide a strategic perspective on capturing value from Distributed Energy Resource (DER) by creating future competitive advantages and optionalities in Southeast Asia (SEA).

Given the widely-varied energy market dynamics and ever-changing landscape across SEA countries, it is challenging to navigate an energy transition.

NRI supports organisations in re-positioning strategy by identifying DER market and technology opportunities that creates optimal growth options whilst managing risks.

In This White Paper, NRI Will Share:

- Why DER technologies are becoming more relevant and how will it enable the energy transition in Southeast Asia
- The power landscape of Southeast Asia and DER potential across various countries
- How your organisation can approach and capitalise on DER opportunities as a diversification strategy in Southeast Asia





Definitions and Development Level of DER Technologies



Macro-Environmental Trends





The power market is gradually decentralising with increasing competition, diversifying power sources and consumption.

- DER is a key strategic consideration in delivering community benefits and business value from:
 - Reducing dependence on centralised power sources.
 - Integrating more renewable energies which are intermittent and unpredictable, and improving grid reliability.
 - •Integrating more small-scale renewable power sources to address energy access and quality issues.

Technology

TECHNOLOGY	KEY DRIVERS	
Microgrid	 Numerous remote islands Un-electrified areas High cost of connecting to the main grid 	
Battery Storage*	 High peak demand charges Subsidies/incentives to encourage batte Government policies mandating the use or 	
EV Charging Infrastructure	 High adoption of EVs 	
Demand Response (DR) and Virtual Power Plant (VPP)**	 DR: Regulated DR market VPP: Attractive feed-in premiums 	
Blockchain***	 Existence and maturity of electricity trad Strong competition between electricity re 	

*Other storage options can be considered based on local resources. | **DR: The aggregation and sale of demand loads to lower electricity use during peak hours. VPP: An arrangement to aggregate the capacities of supply/demand-side energy resources to sell on the electricity market. ***A quick, secure and efficient way to share data and transactions between power generators and consumers.



DER market success will be dependent on the technology and commercial (including affordability) readiness of key technologies.





DER Landscape in Southeast Asia



DER Landscape in Southeast Asia

Potential for greater energy access and quality presents opportunities for DER in Southeast Asia

- Southeast Asia has sizable power market potential given the huge disparity in per capita energy consumption
- 30 million people have no/limited energy access, and only 3 out of 7 countries have high quality and reliable energy access
- DER is a promising solution to address grid congestion, access and reliability in the region



Electrification rate: Percentage of population with access to electricity | Access quality: Based on System Average Interruption Duration/Frequency Indices | Demand/Capita: Electricity consumption per capita (MWh/year) | Demand CAGR: 5 year CAGR of power demand





Indonesia DER Landscape and Potential







Current Market and Energy Transition Plan

licy	Market Characteristics	Energy Transition Plan
Су	 Electricity retails for lower than its cost due to dependence on government subsidies and absence of price pass-through system 	 Aims for higher RE share, but is struggling to introduce RE due to cheap domestic coal and unclear bidding system



Malaysia DER Landscape and Potential



Key Government Po

Green Technology Master Plan



- **Fossil Fuels**
- Hydropower
- Renewable Energy





Current Market and Energy Transition Plan

licy	Market Characteristics	Energy Transition Plan
	 Secures financial resources for Feed- in-Tariffs by establishing a RE Fund Cost pass-through system has raised electricity charges Abundant domestic resources are exported 	 Aims to expand Feed-in-Tariffs while maintaining coal-fired power as base power source DER and smart grids may be introduced to address expected grid shortage in 2025



Myanmar DER Landscape and Potential



Key Government Po

Current

Fossil Fuels

Hydropower

Renewable Energy



2.9x



Current Market and Energy Transition Plan

Government Policy	Market Characteristics		Energy Transition Plan		on Plan	
Myanmar Energy Master Plan	 The country is highly dependent on hydropower generation, leaving the country vulnerable to shortages during dry seasons Coal and hydropower projects face strong public opposition with frequent project delays and cancellations 		 There is significant growth potential in off-grid and microgrid power solutions Grid network remains underdeveloped, but continues to see investments from various multilateral development banks 			
••••••		Potential of DER Technologies in Southeast Asia				
		Potential of Targeted DER Technologies				
urrent 20	2030	Microgrid	Battery storage	EV	DR/VPP	Blockchain
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Drivers/Restraints

Numerous geographical advantages, but implementation abilities may be insufficient

Philippines DER Landscape and Potential



Key Government Po

Power Developmen Plan 2016-2040



Fossil Fuels

- Hydropower
- Renewable Energy



Current Market and Energy Transition Plan

licy	Market Characteristics	Energy Transition Plan
It	 High dependence on imported energy, resulting in high electricity prices Supply is unable to keep up with growing demand 	 Reduce country's dependence on coal for power generation with more gas and renewables, but concrete policies and incentives have not been followed up to achieve their goal



Singapore DER Landscape and Potential







Current Market and Energy	Transition Plan
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licy	Market Characteristics	Energy Transition Plan
су	 Dependent on energy imports as land area is small and RE potential is low 	 Energy structure will remain unchanged
	 Almost all electricity comes from LNG and gas-fired power generation 	 Aims to promote competition and improve efficiency by developing new technologies such as microgrids and hydrogen systems





Thailand DER Landscape and Potential







licy	Market Characteristics	Energy Transition Plan
b	 Introduced price pass-through system at an early stage to optimise electricity rates 	 Expansion of RE in mid-term by leveraging Feed-in-Premiums/ Feed-in-Tariffs
	 Introduced measures to prevent depletion of domestic gas 	 Considering measures such as storage batteries to prepare for future grid constraints

Vietnam DER Landscape and Potential







licy	Market Characteristics	Energy Transition Plan
y to 5	 Electricity retails for lower than its cost due to lack of a price-pass through system Supply is unable to keep up with growing demand 	 Improve renewable energy rate by introducing tenders while maintaining coal-fired power as a base power source Aims to build a competitive electricity retail market by 2022



Unlocking the Value of DER Opportunities



Unlocking the Value of DER Opportunities

Broadly, NRI can support organisations in 3 strategic approaches for new market strategy in the DER market segment.







OPTION 1: ORGANIC DEVELOPMENT

Solo entry or acquire technologies

Leveraging on core strengths to optimise value in ready markets

OPTION 2: COLLABORATIVE DEVELOPMENT

Acquiring new capabilities to address potentially high growth markets

JV, strategic alliances, or acquisition of company to leverage each other's strengths

Pilot deployment to limit risk exposure and test/improve conceptual design for future scaling

Unlocking the Value of DER Opportunities

NRI has a comprehensive framework and capabilities to support organisations in assessing power/DER market scenarios and strategy development to execution.



For information on how NRI can help your organisation realise business opportunities in DER projects, please contact *enquiry@nrisg.com*







About NRI

Nomura Research Institute (NRI) is a leading think-tank and systems integrator. Headquartered in Japan with a global presence across Europe, North America and Asia-Pacific, it specialises in providing IT solutions and management consulting for organisations looking to launch, expand and strengthen their business in emerging Asian countries.



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