



Accelerating the Energy Transition in the Greater Mekong Subregion

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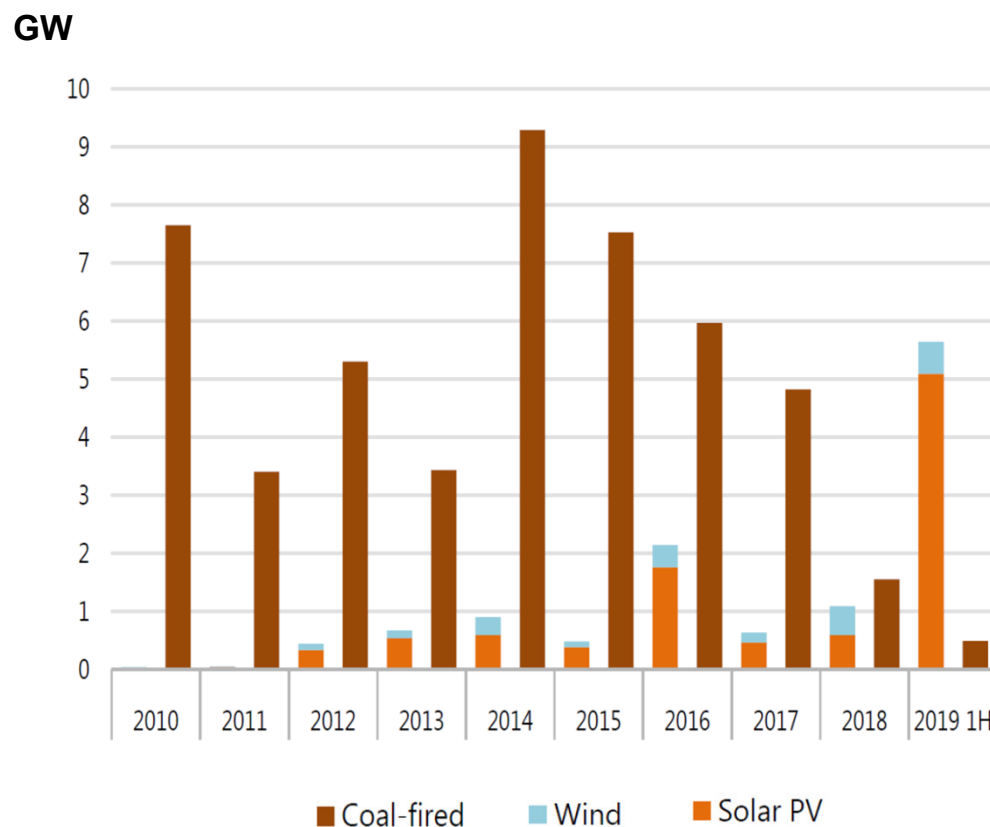
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Emerging Signs of an Energy Transition in Southeast Asia

In the first half of 2019, approvals of new solar PV exceeded coal-fired capacity for the first time...

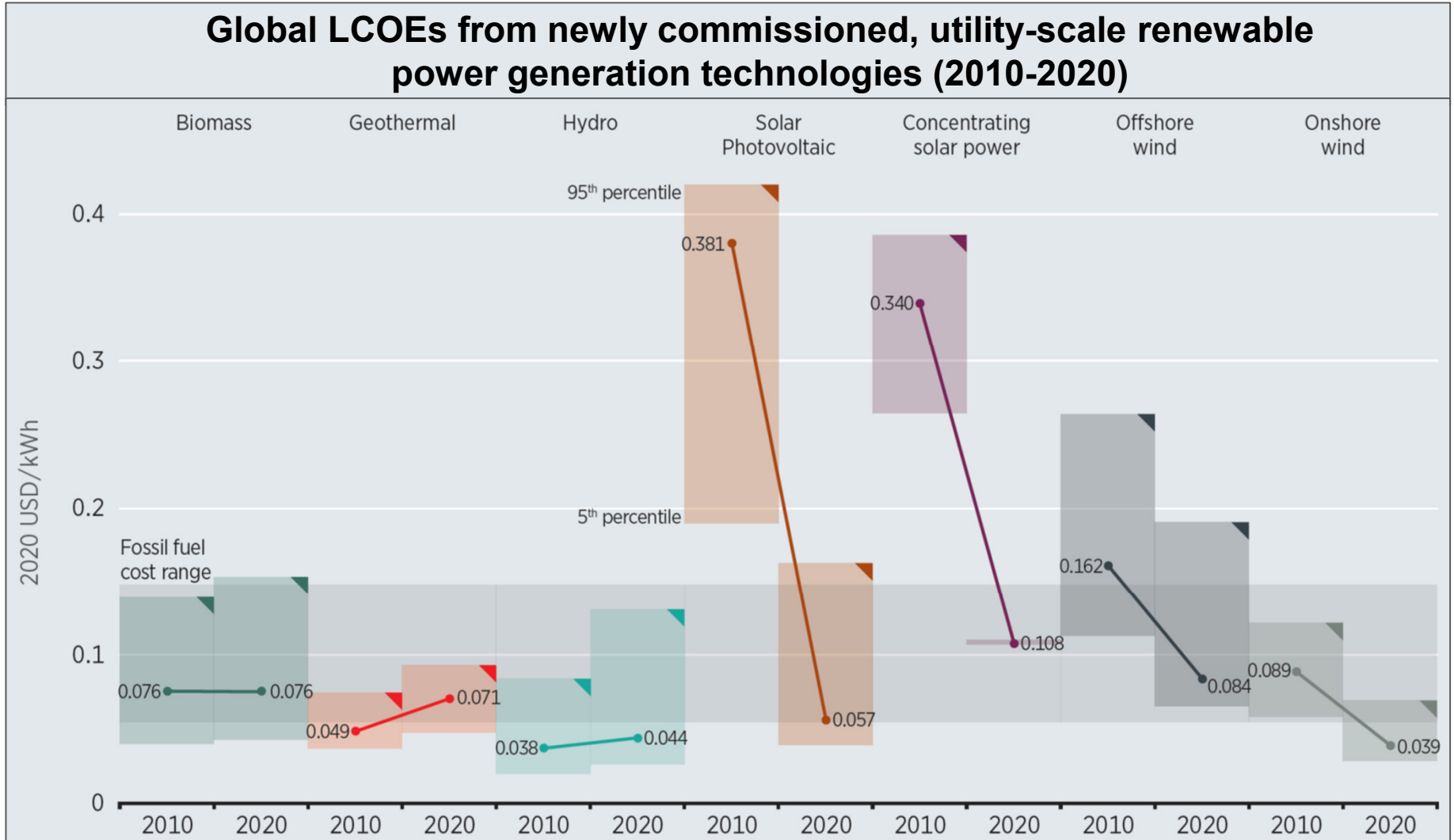
Approved Coal, Solar PV and Wind Capacity Additions in Southeast Asia



- Feed-in tariff program in Vietnam led to an unprecedented growth of solar power, with 16.5 GW installed at the end of 2020
- In 2019, Cambodia launched its first competitive auction for 60 MW of solar PV capacity, resulting in the lowest procurement price in the region at USD 3.9 cents per kWh
- In 2020, Myanmar conducted large-scale auctions for utility-scale grid-connected solar capacity
- New technologies (e.g. floating solar power, offshore wind, battery storage) are also making inroads in the region

Declining Costs of Renewables

Electricity generated from renewable energy sources has declined dramatically over the last decade...



Emerging Technologies are Becoming Cost-Competitive in the Region

Floating Solar

- If land availability for solar PV is an issue, deployment over water bodies should be considered
- Market potential of floating solar PV in Southeast Asia estimated at 24 GW (conservatively)
- First commercial scale projects commissioned in the region in 2020 and 2021, including in Viet Nam, Thailand and Singapore



Offshore Wind Power

- Offshore wind power (OWP) developments have been, until recently, confined to Europe and the People's Republic of China (PRC)
- As prices drop, OWP is gaining traction in emerging Asian economies, including those of the GMS (e.g. Viet Nam has set targets for offshore wind development under PDP-8 draft)
- Southeast Asia could benefit from the development of OWP supply chains in other Asian countries (e.g. Rep. Korea, PRC).

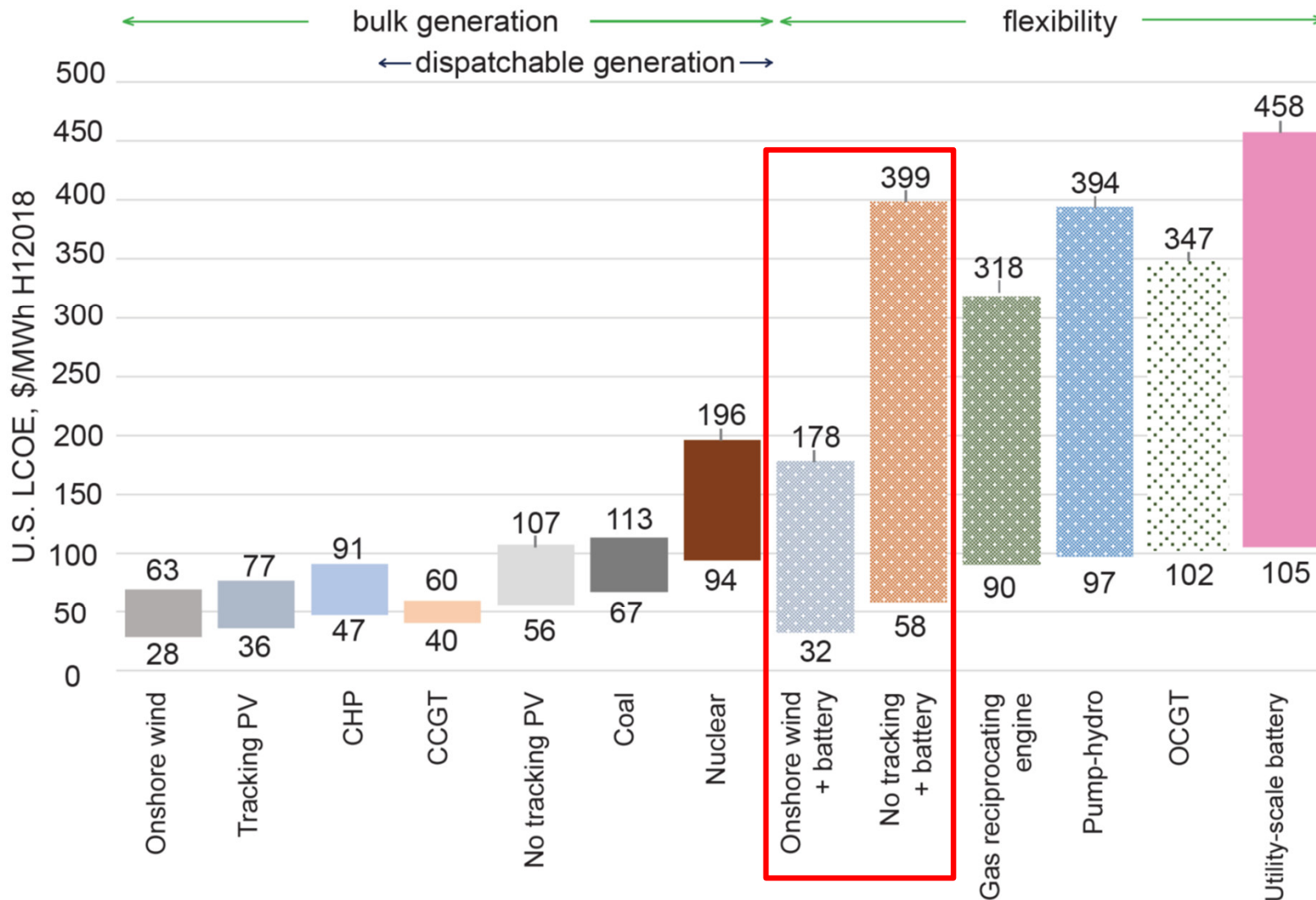


Offshore wind power could lay the foundation for a more ambitious decarbonization pathway, where marine energy resources could be used to produce green hydrogen and alternative fuels (e.g. ethanol, ammonia) for both domestic consumption and export



Cost competitiveness of energy storage and renewables

RE+ storage is already cost competitive with other flexible power plants...

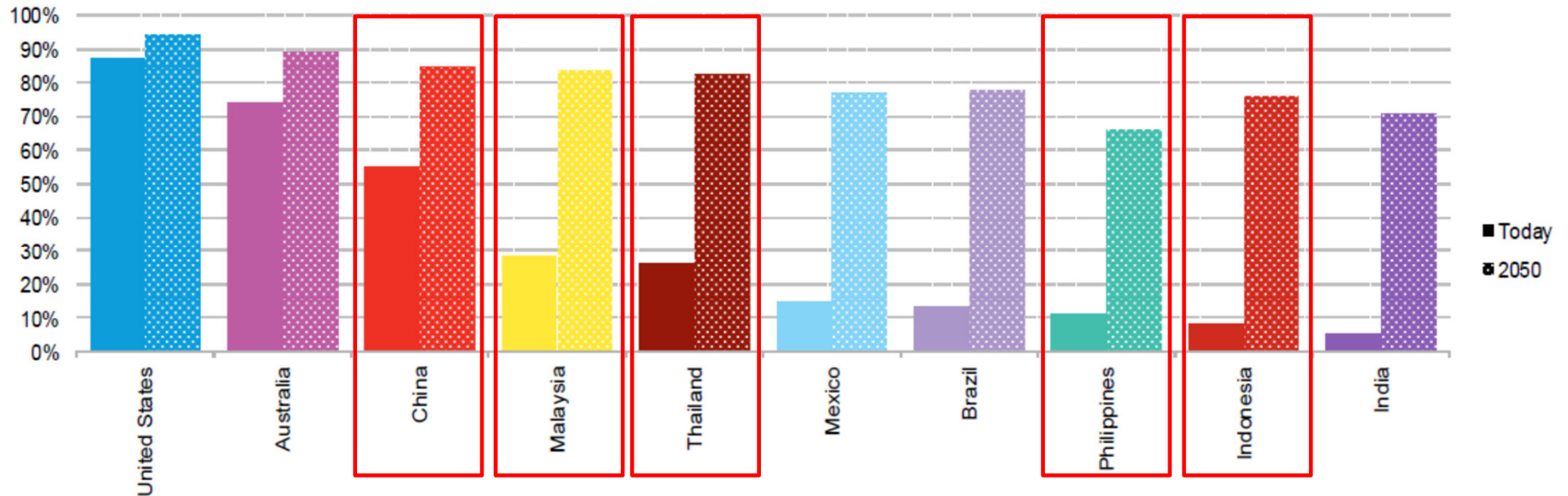


Source: BloombergNEF 2019. INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Energy Efficiency Potential Still Unrealized in the GMS

Energy efficiency is a key approach in the clean energy transition, especially in sectors where demand has been quickly growing, including cooling and road transport...

Ownership rate of A/C systems

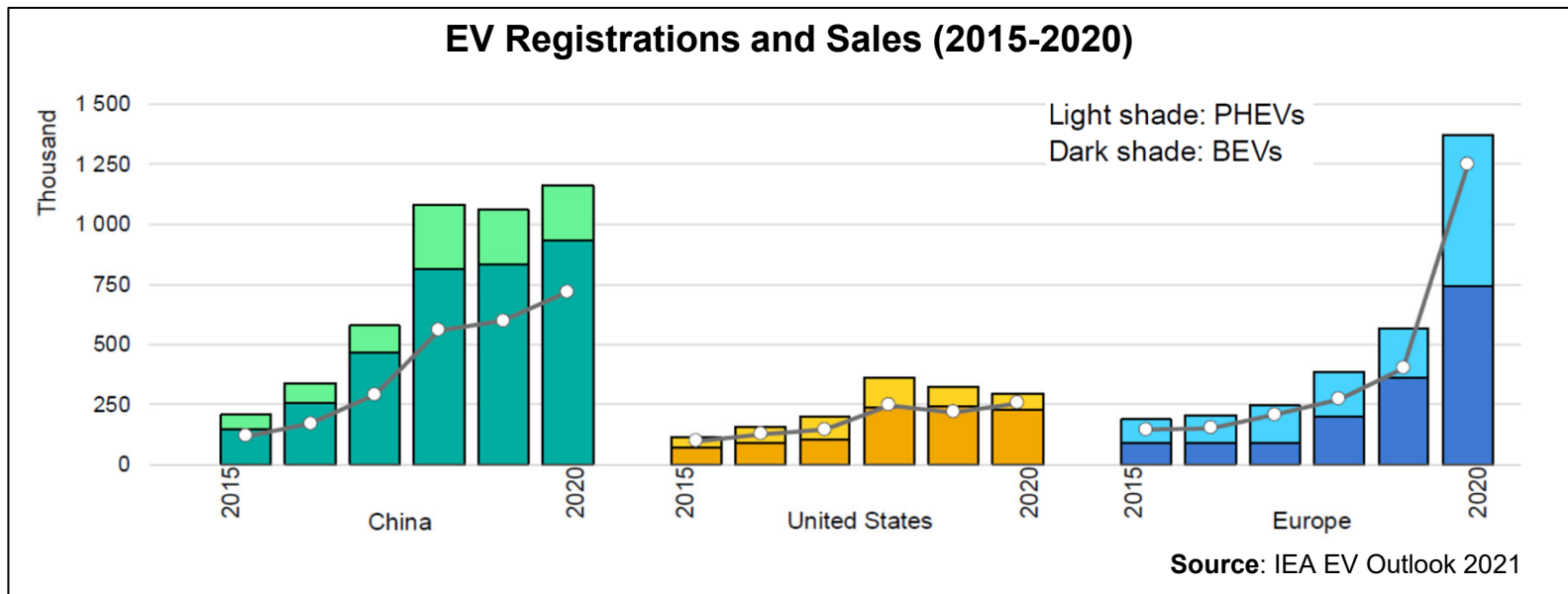


- 80% of households in Singapore have A/Cs; less than 10% in Indonesia, the Philippines and Viet Nam. In some GMS countries, such data is unavailable
- Used and older models are currently imported leading to widespread use of inefficient appliances



Emerging Trends – Electric Vehicles

The sharp EV adoption curves of several major economies is expected to also be observed in countries of the GMS...



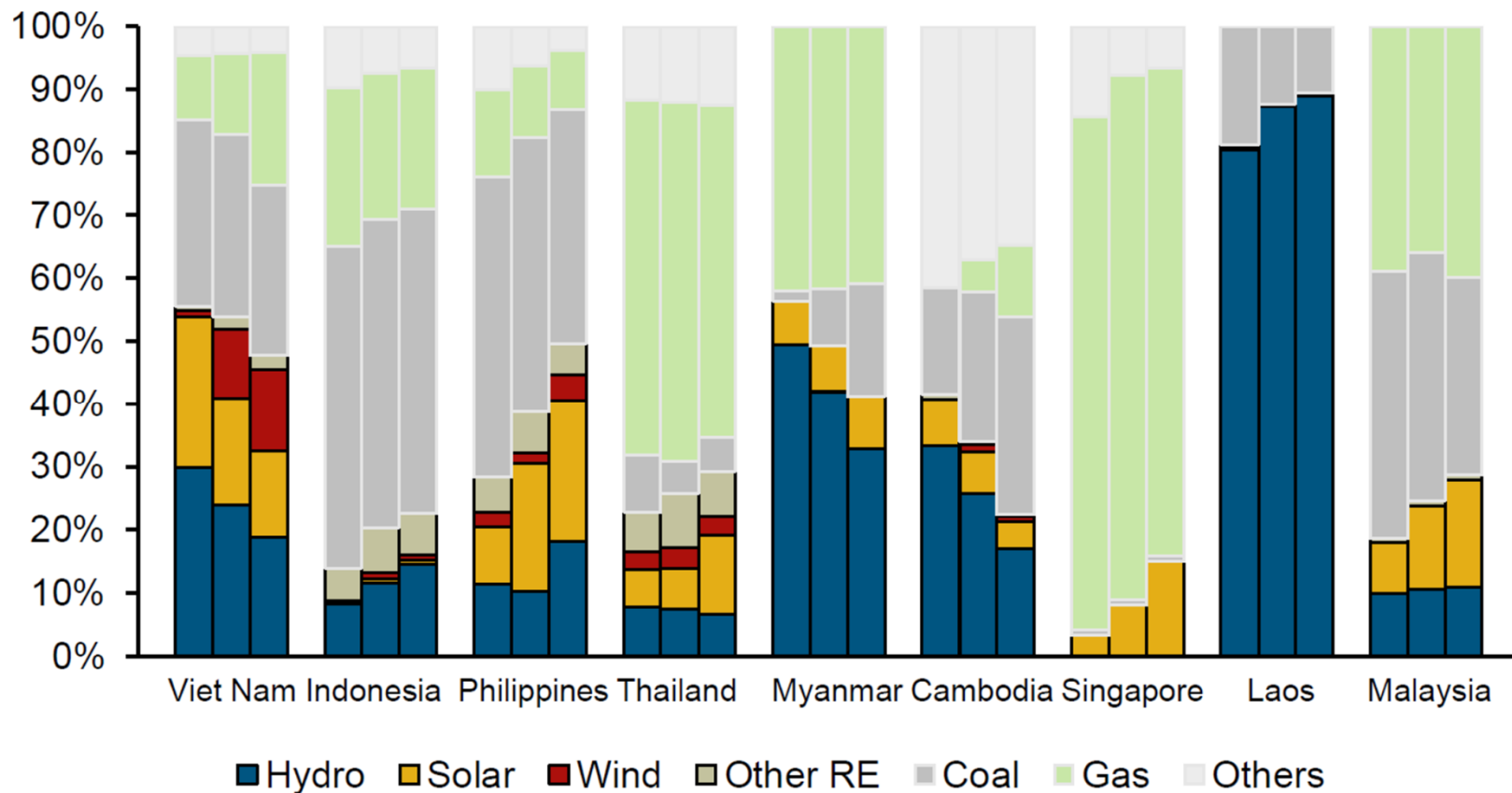
Thailand

- Electrification of the economy is one of the four pillars of Thailand’s Energy 4.0 agenda, and includes the electrification of vehicles
- National target of 1.2 million electric vehicles and 690 charging stations by 2036
- Thailand’s Board of Investment provides tax holidays of 5-8 years and exemptions on import duties for cars and machinery relating to battery electric vehicles, hybrid electric vehicles, and plug-in electric vehicles.

Power Generation Mix in Southeast Asia

Despite these emerging signs, the power generation mix of Southeast Asia is still dominated by fossil fuels, and the share of coal is expected to increase in some countries...

**Power Generation Capacity Mix in Southeast Asia Countries
(2020, 2025E, 2030E)**



Source: TLG 2021

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Governments Role in the Energy Transition



Set ambitious targets and undertake planning in the face of uncertainty and as part of Covid-19 economic stimulus programs



Support keystone investments and lay out the conditions for private sector investment



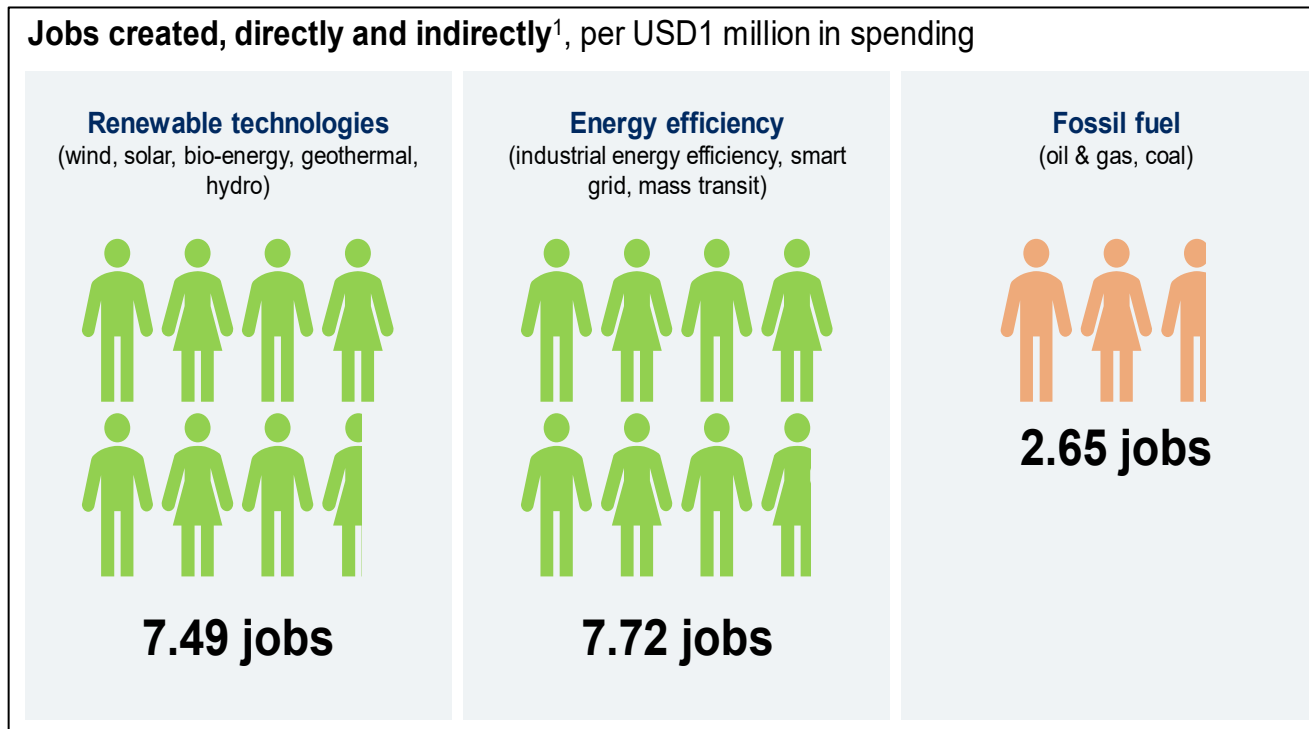
Support the entry of new actors and the creation of new markets



Enable greater access to green finance

Green Recovery Programs and the Energy Transition

Green recovery programs implemented by governments in response to the COVID-19 crisis could support accelerating the energy transition, leading to the creation of green jobs including for women



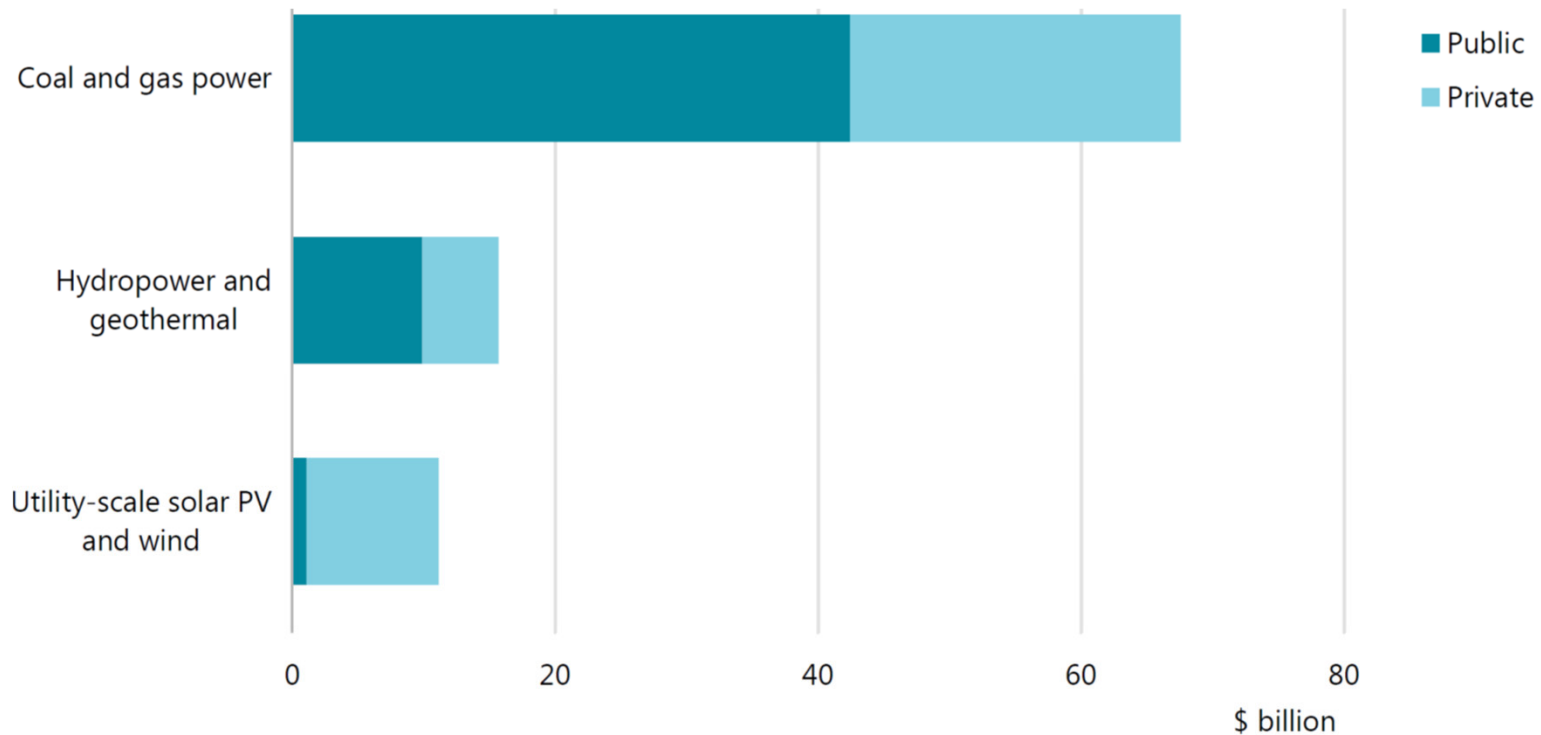
- Government spending on renewable energy and energy efficiency has been shown to create more jobs than spending on fossil fuels
- A study of IRENA found that women represent 32% of the renewable energy workforce, and account for only 22% in the oil and gas industry

Source: Heidi Garrett-Pelter (2017); McKinsey & Company (2020); IRENA (2020)

Energy Investments Flows in Southeast Asia

Governments have tended to finance coal, gas and hydropower plants, while the private sector has tended to finance renewables

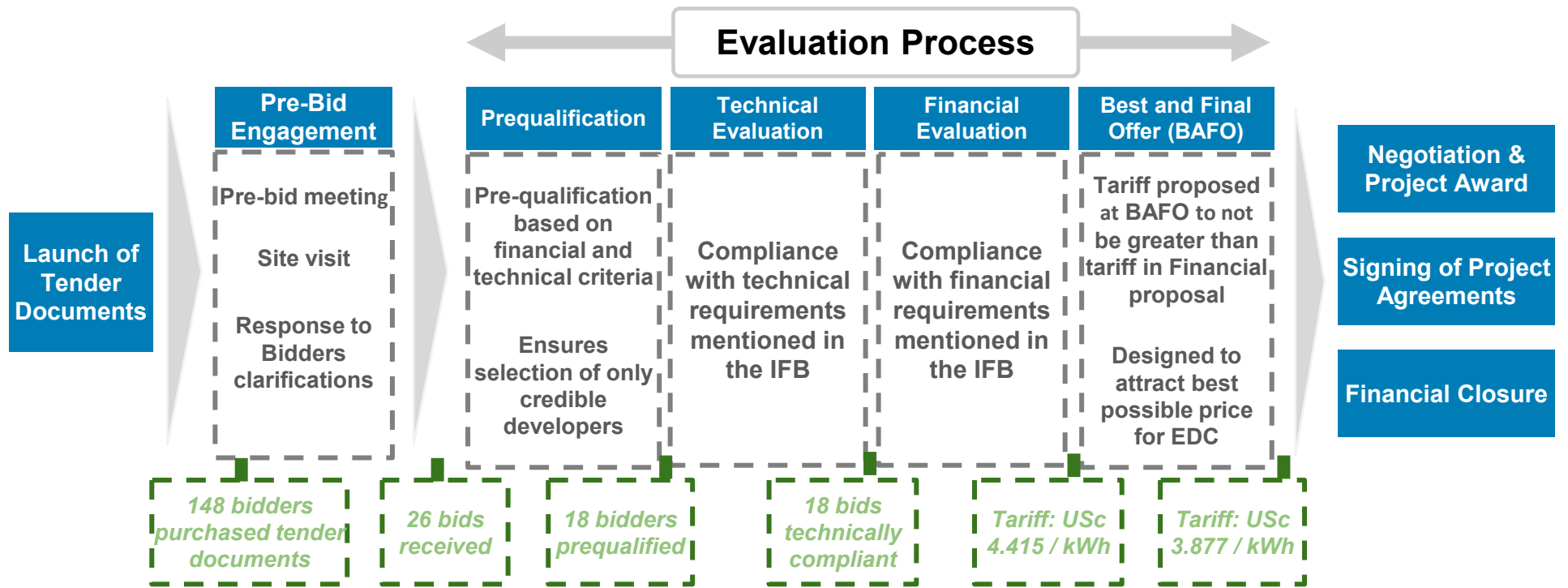
Sources of finance for power generation investment in Southeast Asia
(by year of FID, 2014-2018)



Source: IEA 2019

De-risking Renewable Energy Investments

Reverse Auction in Cambodia's National Solar Park Project



Pre-bid Meeting



Site Visit



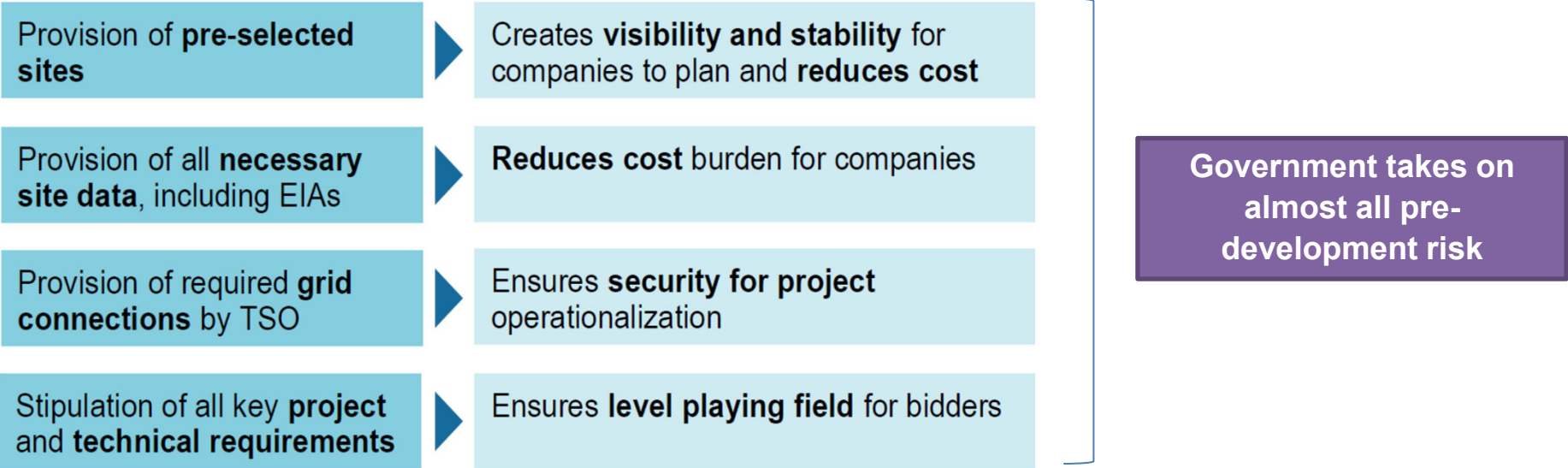
Public Opening of Financial Proposal



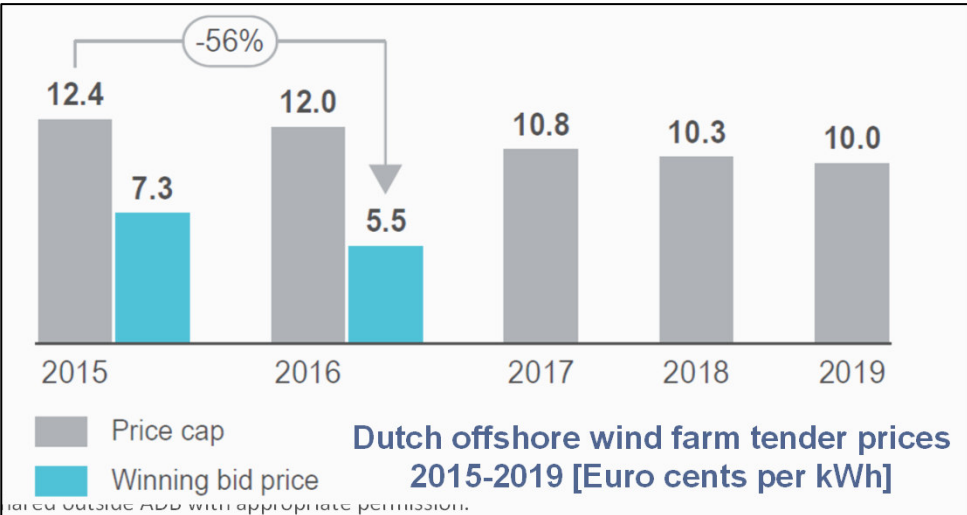
Public Opening of BAFO

The Dutch model: De-risking of Offshore wind

Reduction of pre-development risks for companies have contributed to price reductions in offshore wind projects in the Netherlands



- Reduction of pre-development risks for companies has contributed to price reductions
 - With all equal, price becomes the key criteria for winning a tender
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New actors are emerging...

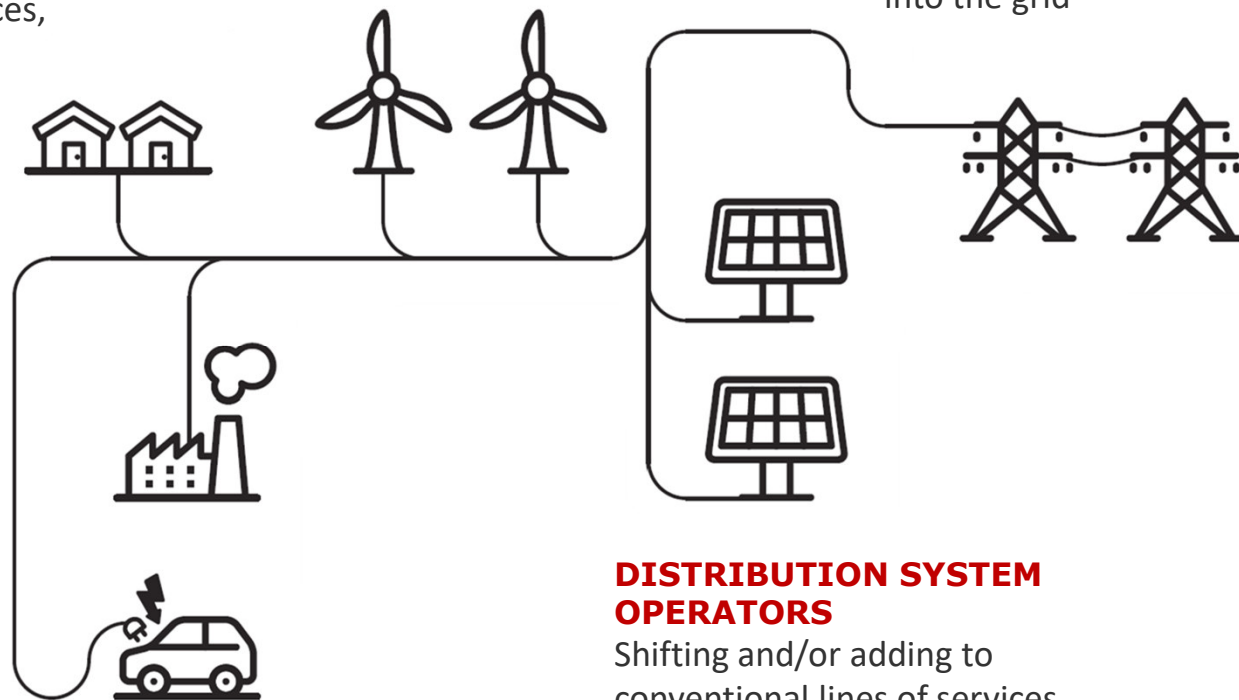
Renewable energy technologies, digitalization and decentralization of energy generation is creating opportunities for new actors along the value chain...

AGGREGATORS

An aggregation of disperse distributed energy resources, enabling them to provide services to the grid

GENERATORS

Increasing shares of VRE into the grid



PROSUMERS

Electricity consumers are starting to generate their own power from distributed energy resources, becoming producers and consumers

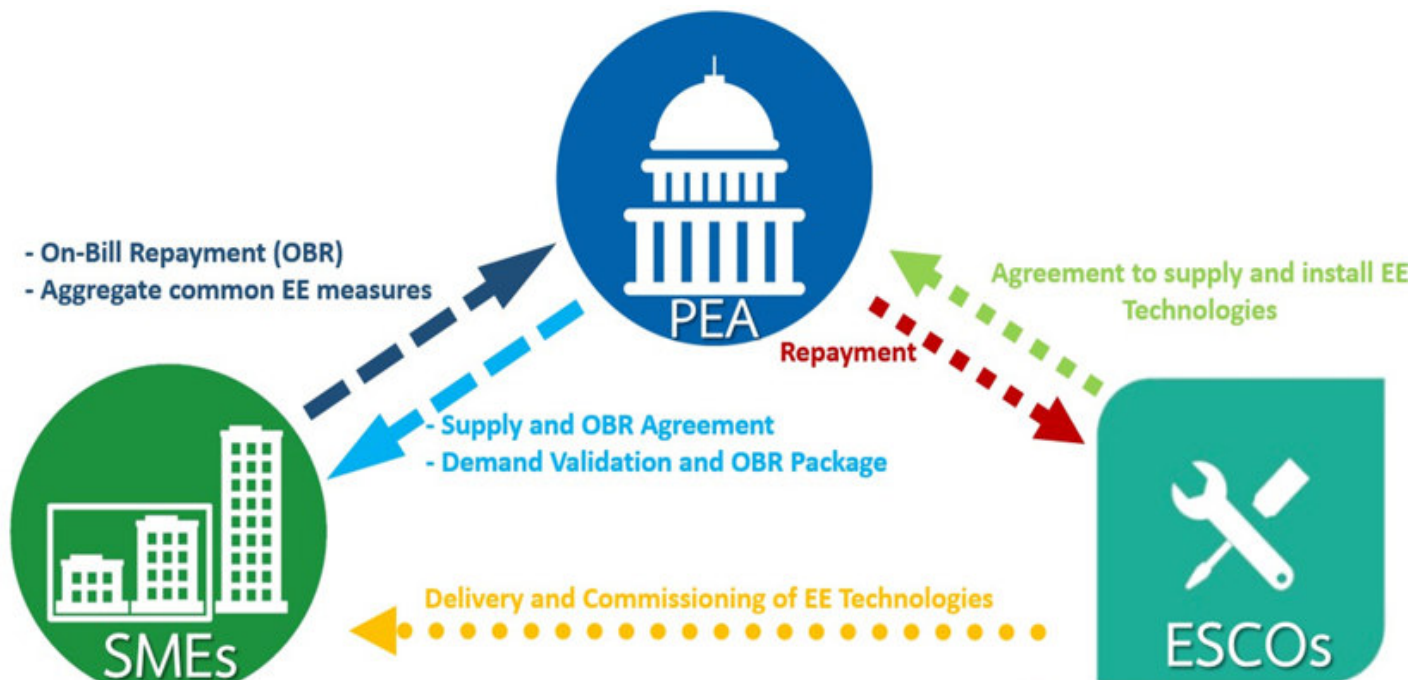
DISTRIBUTION SYSTEM OPERATORS

Shifting and/or adding to conventional lines of services roles such as peak reactive power support, voltage support or peak load management

Governments Need to Support New Actors and New Business Models

- Energy-as-a-Service
- Peer-to-Peer Power trading (with Blockchain applications)
- Energy Efficiency Services
- Community-led Models

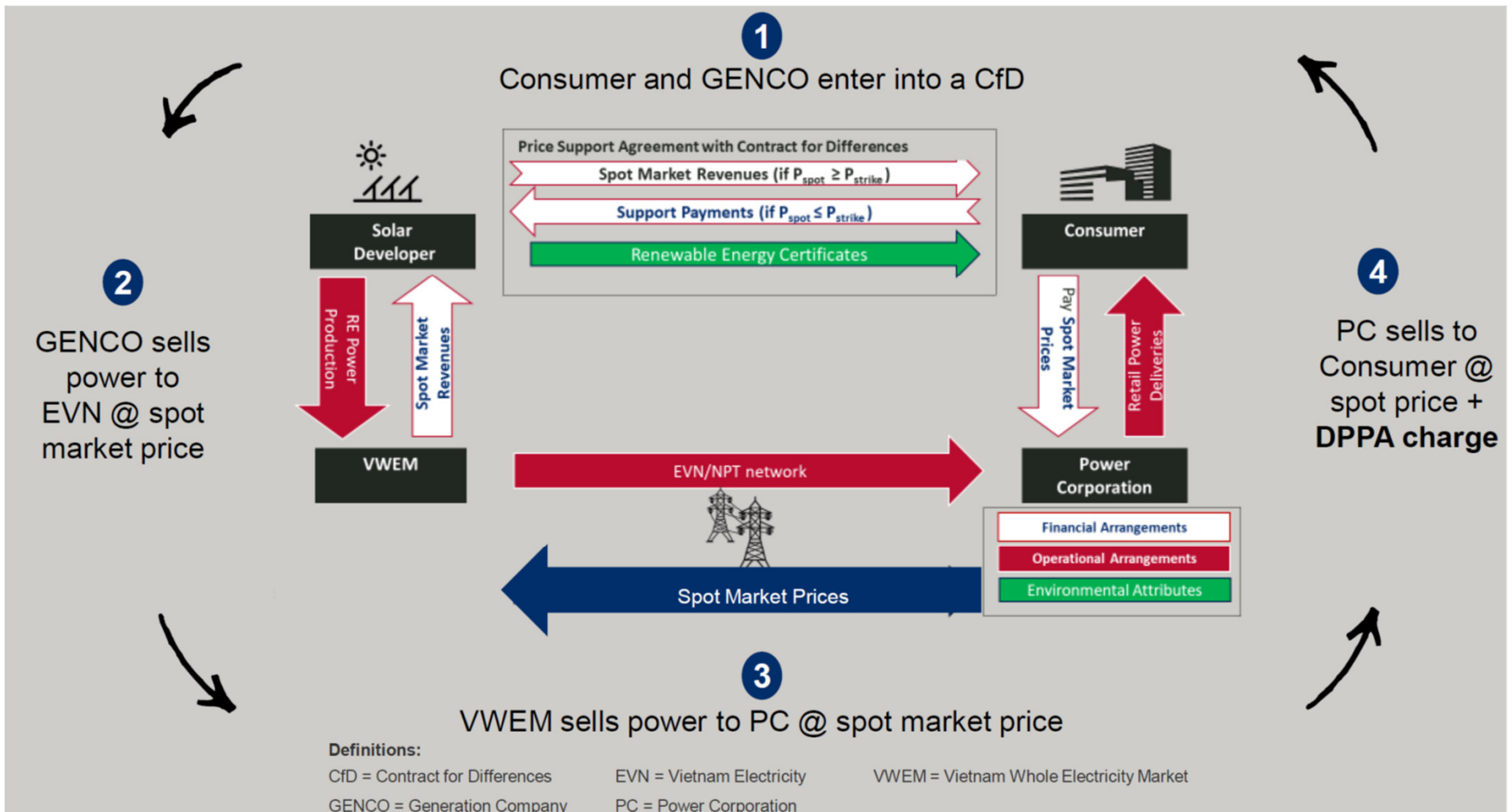
Example of New Business Models that Government can Support



Thailand's Provincial Electricity Authority (PEA) has developed an On-Bill Financing business model that facilitates energy efficiency investments in SMEs through energy service companies (ESCOs)

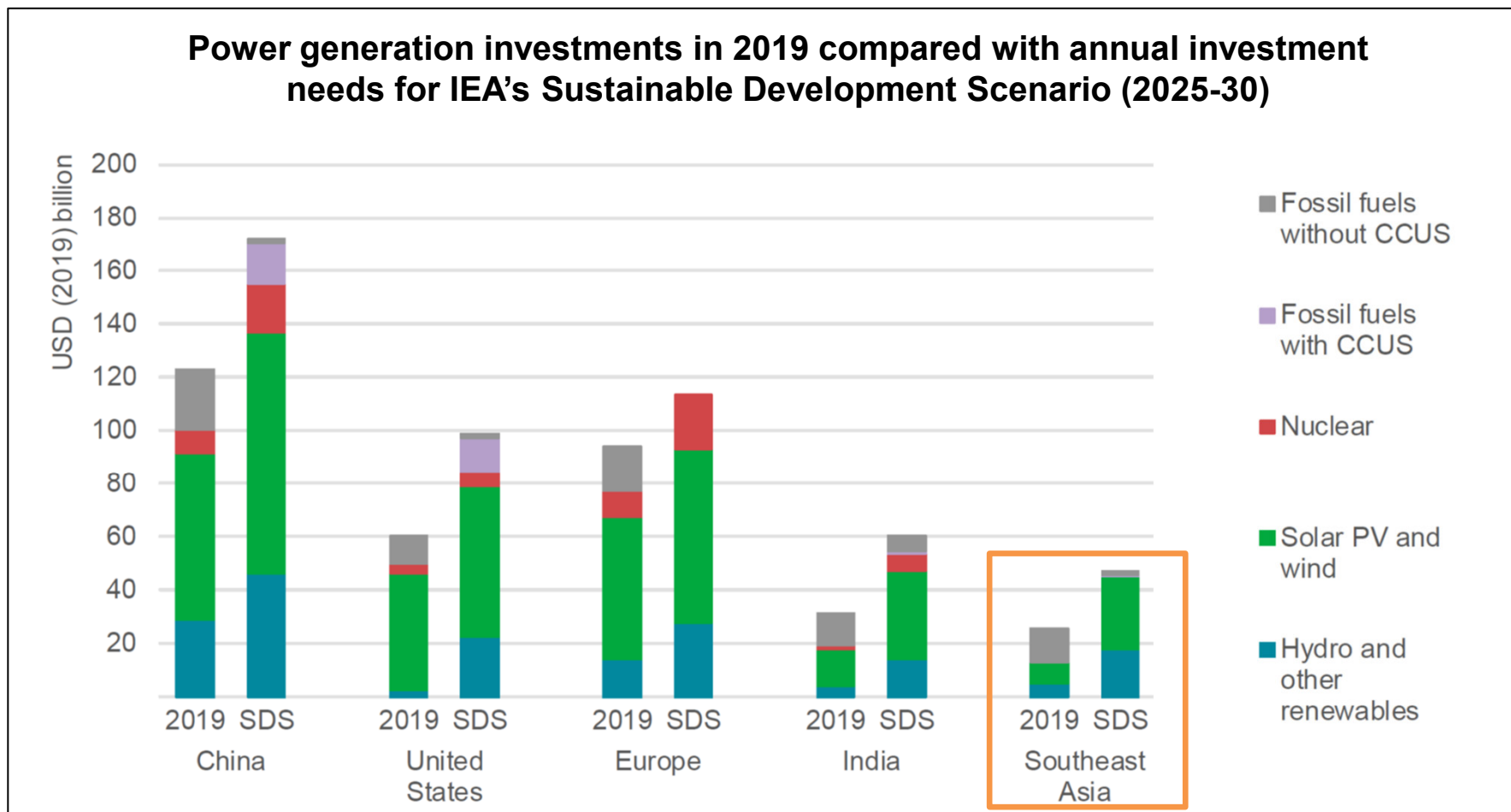
Peer-to-peer trading in Viet Nam

Viet Nam is piloting a Corporate PPA Framework for renewable energy developers, which will enable the establishment of “direct” power purchase agreements between renewable energy producers and private off-takers



Energy Transition – Financing Needs

The International Energy Agency estimates that the energy transition in Southeast Asia will require average annual investments in the energy sector of \$140 billion until 2040



Green Financing – ASEAN ESG Bond Landscape

Cumulative issuance of green, social and sustainable (GSS) bonds and loans in ASEAN now stands at USD 29.4 bn.

Issuance of GSS bonds and loans reached a record high of USD 12.8 bn in 2020 with Singapore as the leader.

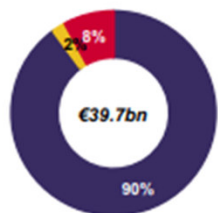
Green labels dominate, while social and sustainability instruments are gaining more interest.



Source: Climate Bond Initiative

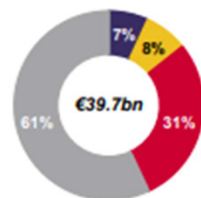
Energy Sector – ESG Bond Issuances

1 Split by amounts issued (EURbn) **2** Split by amounts issued (EURbn) **3** Split by amounts issued (EURbn)



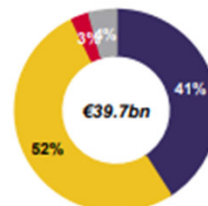
■ Green bond ■ Sustainability ■ SLB

- Companies in Energy sector issue mainly green bonds to fund their ESG projects.



■ <€300m ■ €300m-€500m ■ €500m-€700m ■ >€700m

- The vast majority (86%) of ESG bonds issued were in tranches larger than EUR 500m.



■ USD ■ Euro ■ JPY ■ Others¹

- USD and EUR are the two most frequent currencies to issue ESG bonds.

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- Tenors of ESG instruments are below **10 years** in 50% of precedents.
- Almost all precedents have been listed on the issuer's usual listing venue with no change for their ESG transaction.

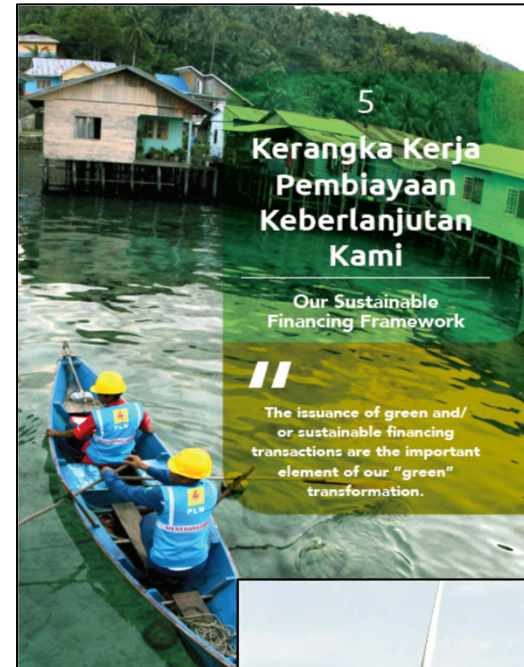
Sources: Dealogic, Debtwire, Bloomberg (06/04/2021)

Energy Players



Example of ADB Support in ASEAN – PLN's Maiden ESG Bond

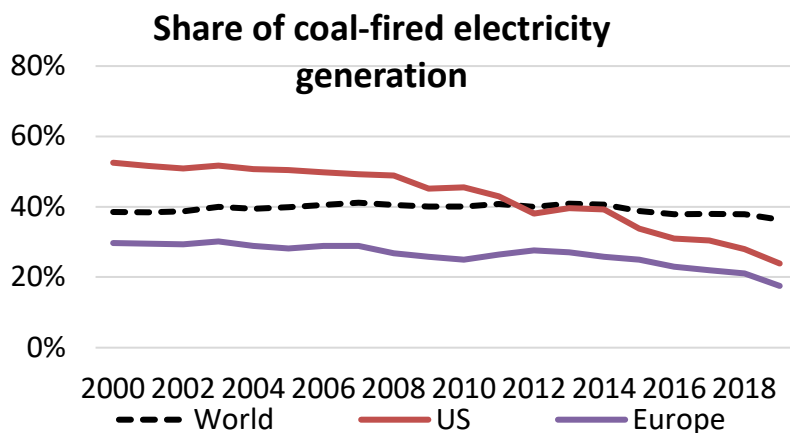
- PLN as a large Indonesian SoE is embarking on an ambitious sustainability program to move consciously towards renewables
- ADB has been supporting PLN with the launch of their Statement of Intent for Sustainable Financing which was launched in October 2020:
<https://web.pln.co.id/statics/uploads/2020/10/Statement-of-Intent-on-Sustainable-Financing-Framework.pdf>
- ADB is working with a cross functional team with project consultants, bankers, structuring professionals and PLN's internal team on the following topics:
 - Project eligibility
 - ESG Bond framework development
 - External review
 - Pre- and post- issuance stages



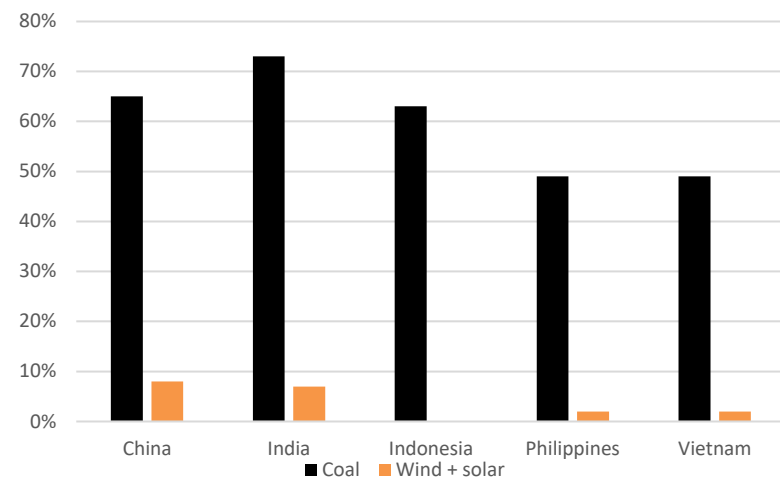
Energy Transition Mechanism (ETM): Accelerating Asia's Transition from Coal to Clean Energy

- Coal plants in many developing Asian countries are locked into long-term offtake agreements so a “financial mechanism” to intervene is needed
- Removing coal plants from the grid unlocks investment in renewables, storage, hydrogen, EVs, and other clean technologies
- ETM is proposed as a replicable and scalable market-based model to transition from coal to clean power.
- Strong momentum to announce a partnership at COP26 for selected ASEAN countries and launch the country funds in 2022
- ADB to help crowd in public and private sector partners, support a just transition for affected communities, ensure climate credentials, and harness carbon offsets

Share of coal-fired power has dropped in US and Europe...



...but remains very high in developing Asia

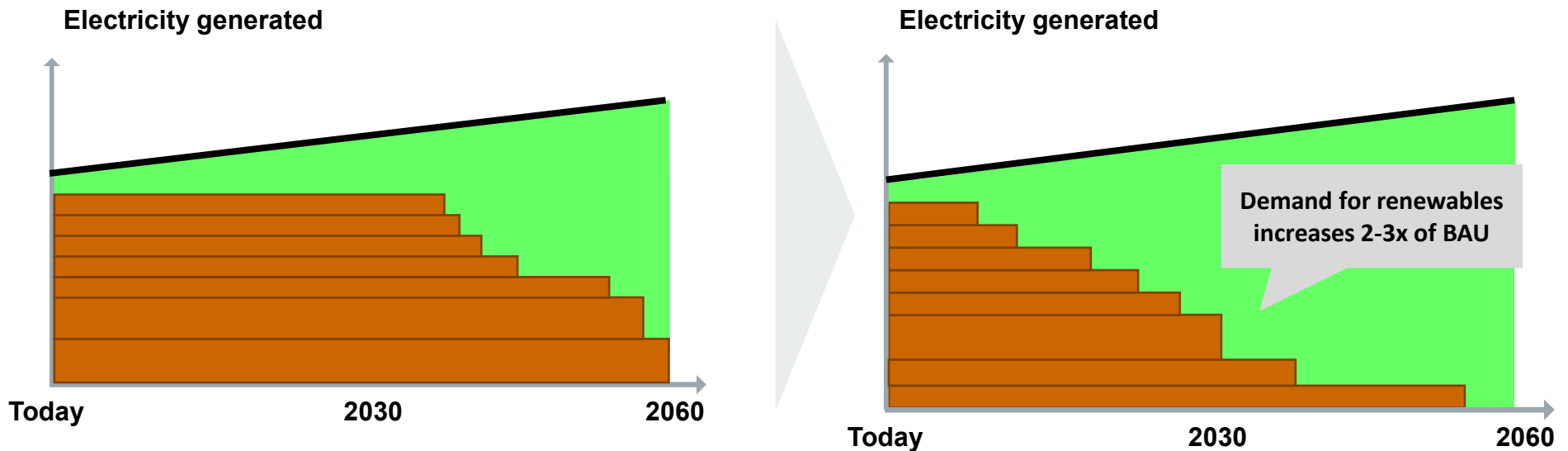


Energy Transition Mechanism (ETM) Concept

Speeding up the retirement of coal-fired electricity can increase the demand for clean energy investment 2-3x, reduce emissions, and lower generation costs in the long run

Business as usual

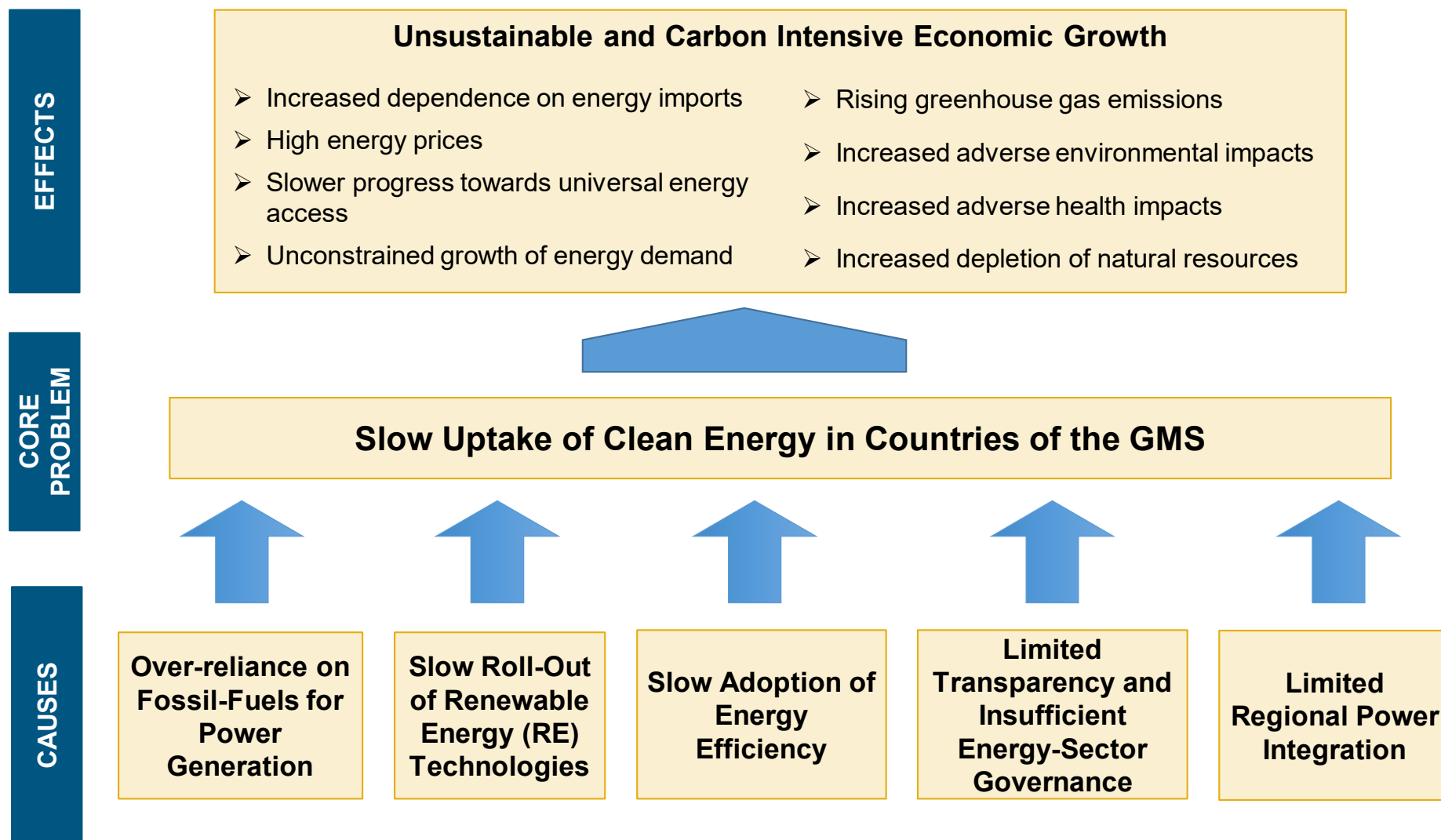
With the Energy Transition Mechanism



- Total energy demand
- Coal-fired assets generation and retirement over time
- Renewable energy generation over time

Existing coal-fired power assets retired early, creating additional demand for renewables

ADB Launched New Regional TA to Support Accelerating the Clean Energy Transition in Southeast Asia



Overview of the Regional TA

Objective: To support DMCs of Southeast Asia in creating the enabling conditions to accelerate the clean energy transition

Implementation Period: June 2021 to June 2024

Total Funding: \$4.55 million

Illustrative activities:

- First activity – design and set-up of the ETM
- Conduct of market assessment studies, renewable energy resource assessments, grid-integration studies, etc.
- Assistance to DMCs in the development of policies and regulations
- Knowledge sharing and capacity building through workshops and policy dialogues
- Identification and development of clean energy projects



Thank you for the attention



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