



On behalf of



of the Federal Republic of Germany

Role Enhancing SEA's Energy Transition: Spotlight on Solar PV

13 October 2021

Dr. Tharinya Supasa

on behalf of Clean, Affordable and Secure Energy (CASE) for Southeast Asia



Agora Energy – Who we are

- **Think Tank and Policy Lab**
- **More than 60 energy transition experts**
- **Independent** and non-partisan with diverse financing structure
- **Our Vision** - A prosperous and **carbon neutral global economy** by 2050
- **Policy advise** to deliver **clean power, heat and industries** – in Germany, Europe and around the Globe
- **Headquarter in Berlin**, with offices in Brussels, Beijing and Bangkok



CASE Countries and Regional



4 countries:

- Vietnam
- Indonesia
- Philippines
- Thailand

Supported by an international / regional umbrella



Coordinator



Regional Implementing Partners



Aligned programme of



National Implementing Partners

 	 	  	 
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About the CASE programme



Objective: The narrative of the direction of the energy sector in Southeast Asia has substantially shifted towards an evidence-based energy transition, aiming to increase political ambition to comply with the Paris Agreement.

Outputs



Research and Evidence

The evidence base for an energy transition in SEA is improved



Transparency and Mapping

Synergies between different energy transition activities in the region are maximized due to increased transparency and cooperation



Dialogue Non-energy sector

The dialogue on energy transition within government bodies is improved



Technical Assistance (energy)

The capacities of key energy sector stakeholders to undertake an energy transition are strengthened



Promoting public discourse

A public discourse on energy transition is established

CASE activities alignment with APAEC Phase II key strategies



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for Southeast Asia

On behalf of



Federal Ministry for the
Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany



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1. ASEAN Power Grid

To **expand regional multilateral electricity trading, strengthen grid resilience and modernisation, and promote clean and renewable energy integration.**



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2. Trans-ASEAN Gas Pipeline

To pursue the development of a **common gas market** for ASEAN by enhancing gas and LNG connectivity and accessibility.



3. Clean Coal Technology

To optimise the **role of CCT in facilitating the transition** towards sustainable and lower emission development.



4. Energy Efficiency and Conservation

To **reduce energy intensity** by 32% by 2025 and encourage EE&C efforts, especially in transport and industry



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5. Renewable Energy

To **increase the share of RE** to 23% in TPES and 35% in installed power capacity by 2025



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6. Regional Energy Policy and Planning

To advance energy policy and planning to **accelerate the region's energy transition and resilience**

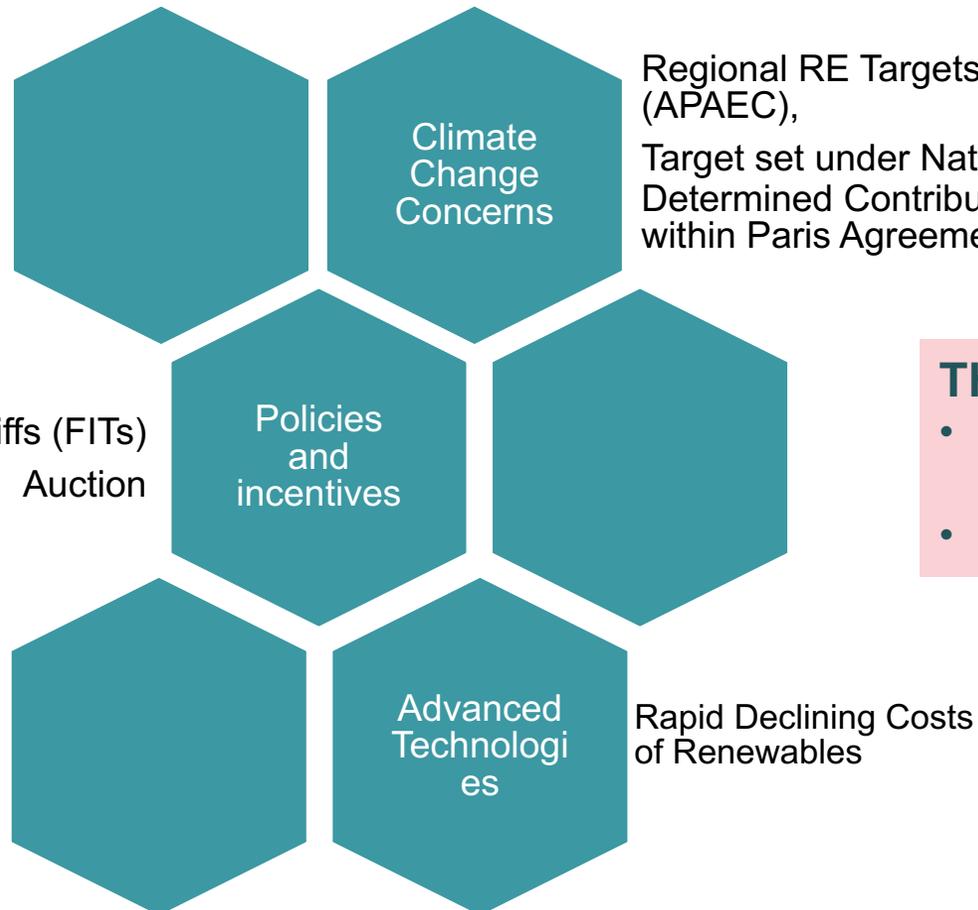


7. Civilian Nuclear Energy

To build **human resource capabilities on nuclear science and technology for power generation.**



Drivers of Solar Power Growth in Southeast Asia



Indonesia: Government plan to reach net zero in 2060

- Green RUPTL
- No new coal power plant (except those already in FC and under construction)
- Planning a carbon pricing mechanism

Thailand: to reach carbon neutrality in 2065-2070

- Increase the RE generation to over 50% of the total electricity generation
- Status: framework and public hearing

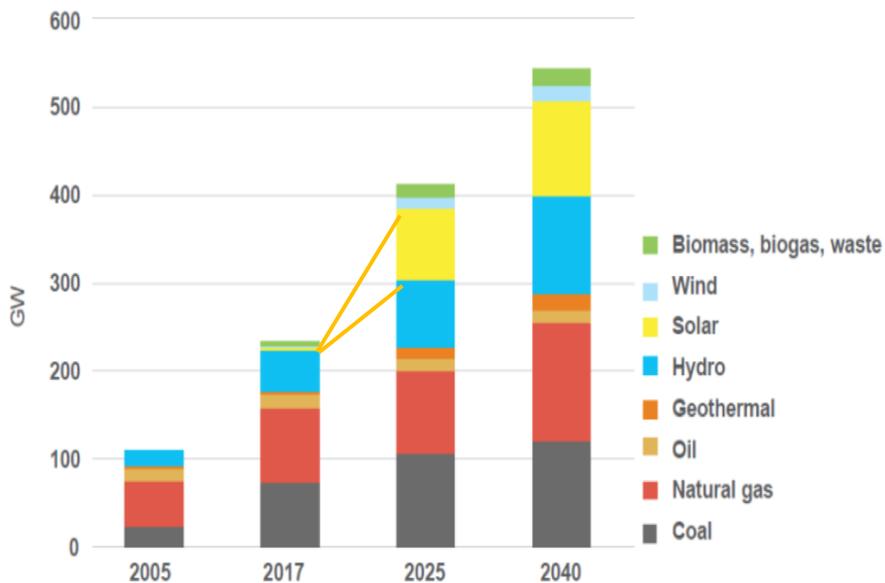
Vietnam: clear government commitment to renewable energy and energy availability, and local air quality.

The emerging lobbying power of the solar and wind industry has been a relevant factor. As Vietnam is a potentially lucrative market, mergers and acquisitions of solar and wind projects have been on the rise, with the key investors coming from Thailand, Singapore, and the Philippines (Apricum, 2020).

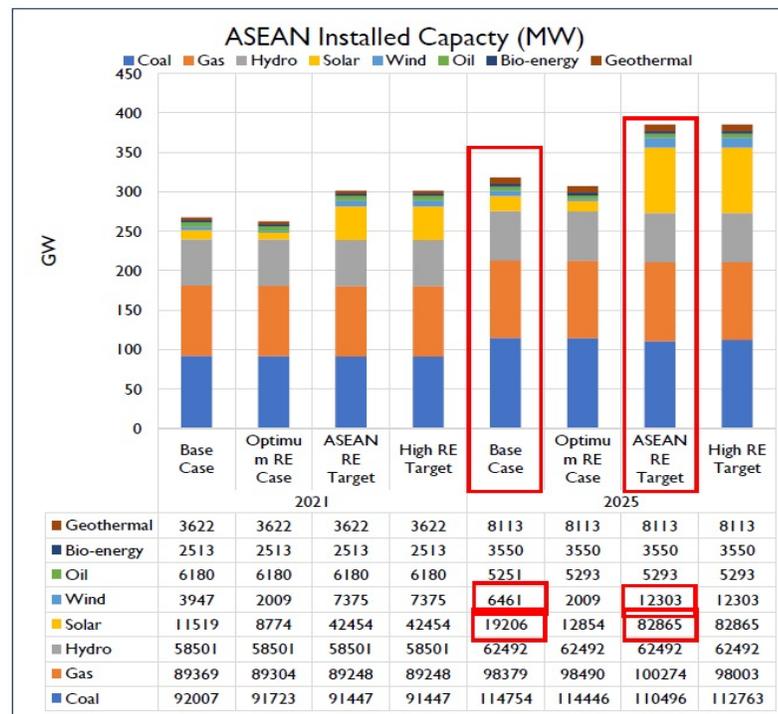
Southeast Asia Renewable Outlook:

To meet regional renewable energy target of 23% by 2025

- Collective efforts from AMS will drive ASEAN to achieve around 18% share of RE in TPES by 2025.
- To close the gap, more than doubling Solar and Wind power installation & generation shows promise measure.
- 66 GW of new Solar power plants evaluated by AIMS III project show the high potential to connect to the existing grid lines by limiting VRE constraint at 20%.



Source: ACE (2020). The 6th ASEAN Energy Outlook



From 2020 to 2025, solar PV capacity across ASEAN increase from **32 to 83 GW, 159% increase.**

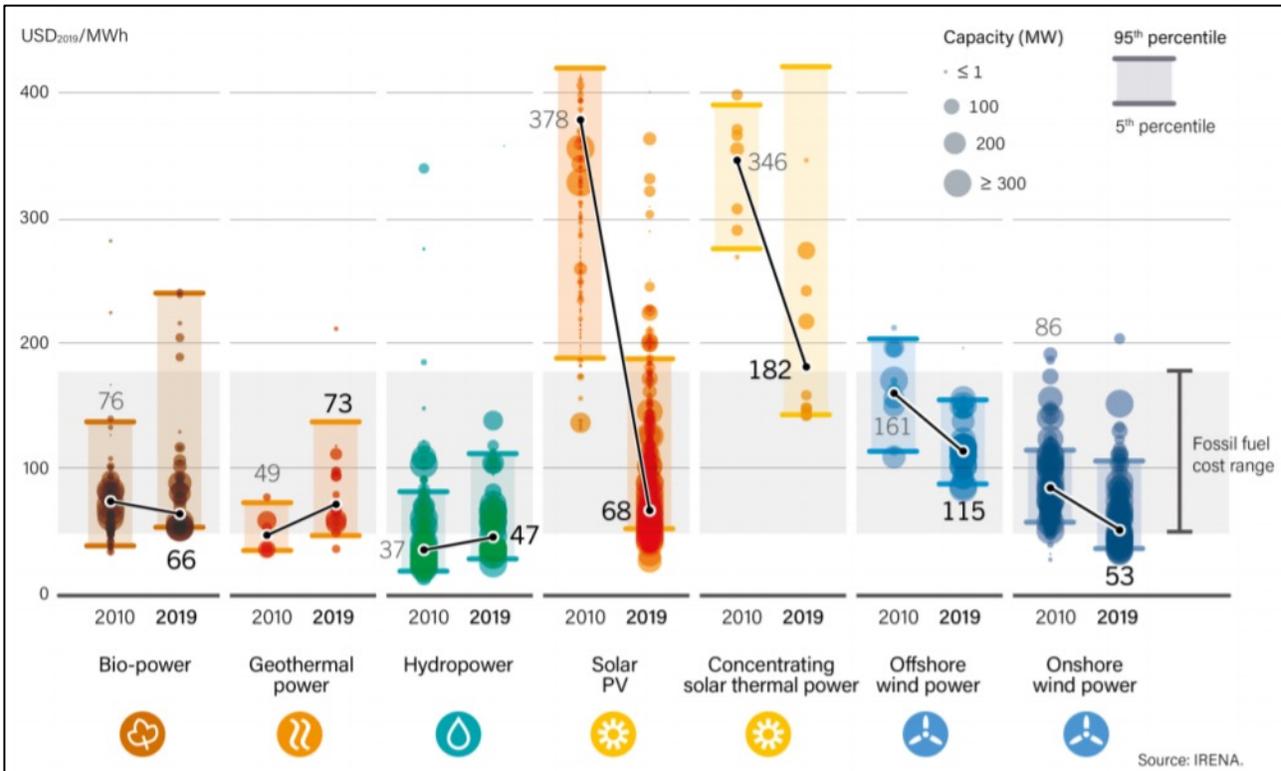
Require supporting activities...

- Improving access to finance
- Integrated ASEAN Power grid
- Supporting policy scheme and deregulation
- Capacity building of power sector stakeholders
- Role of power market for RE integration

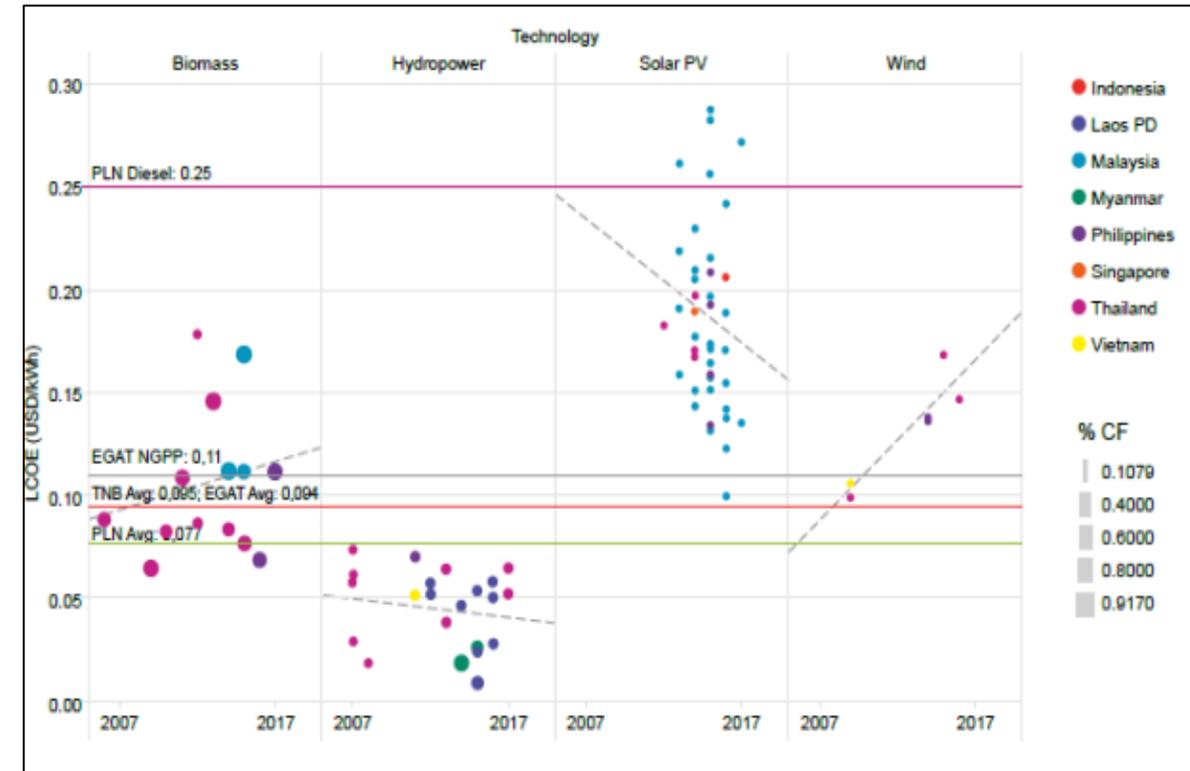
Declining Costs of Renewable Power Generation



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Note: Global levelised cost of electricity (LCOE) from newly commissioned, utility-scale renewable power generation technologies, 2010 and 2019



Solar Supporting Policies and Incentives in 2021

Countries	RE target	Feed-in Tariff	Competitive bidding	Renewable Energy Certificate (REC)	Net-metering	Tax incentives	Soft loan
Indonesia	✓		✓		✓	✓	✓
Malaysia	✓	✓	✓	✓	✓	✓	
Philippines	✓		✓	✓	✓	✓	
Thailand	✓	✓	✓	✓	✓	✓	✓
Vietnam	✓	✓	✓		✓	✓	

- Collect from various sources e.g. government bodies, donors
- Collected until in October 2021

Energy Transformation Technologies



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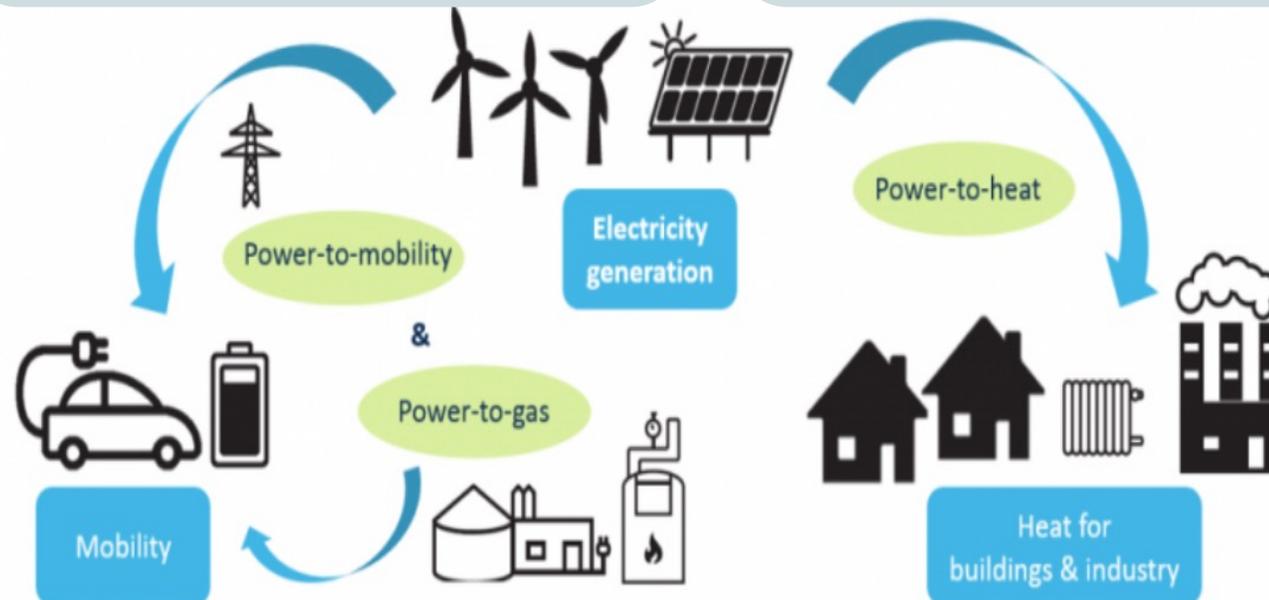
Electrification of end-use sectors and fueling them with low-carbon technologies

Meet demand with renewable electricity

Sector coupling (sectors become more integrated)

Increased Power System Flexibility

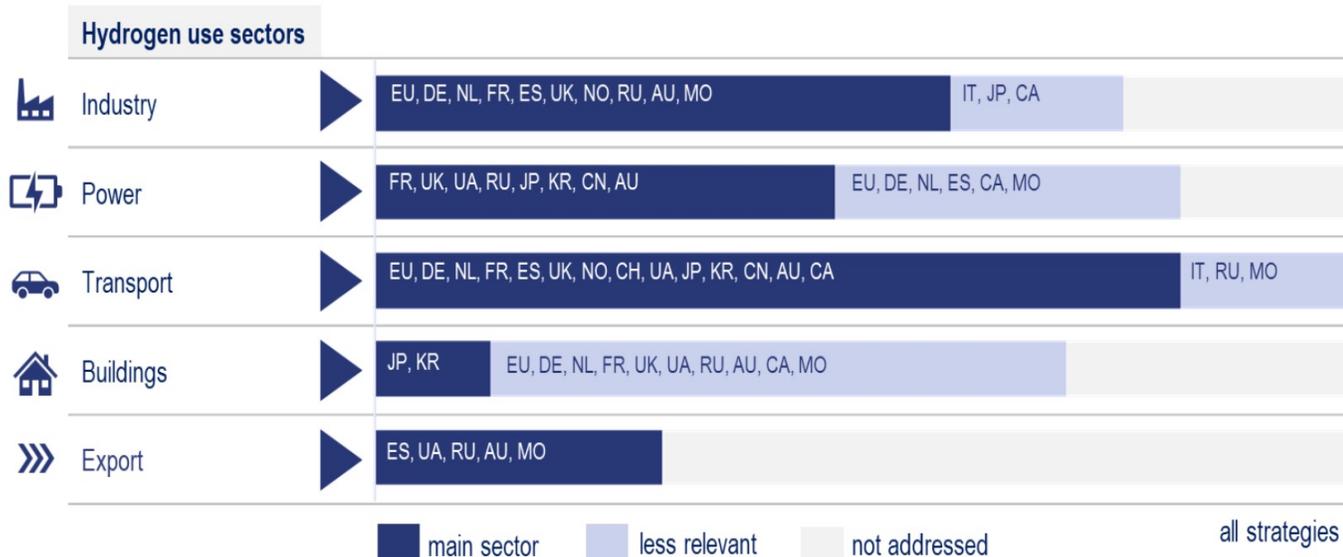
Enabling integration of high shares of solar and wind





Hydrogen is critical for reaching climate-neutrality as it is needed for decarbonizing hard-to-abate sectors.

- Hydrogen target sectors in international hydrogen strategies



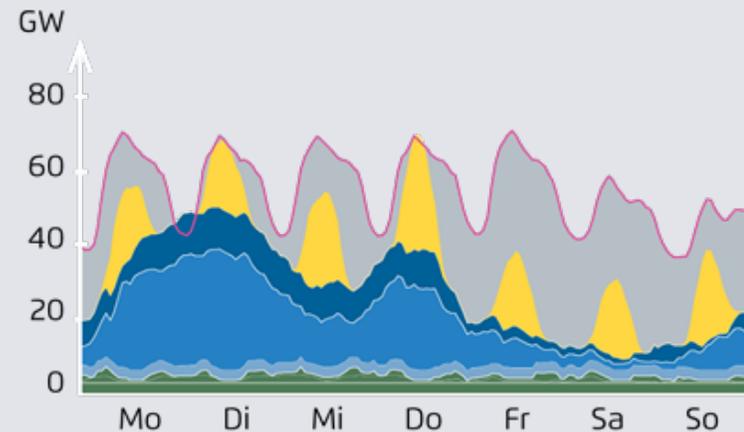
- Climate-neutrality** („net zero“) goes beyond -80% to -95% GHG emissions
- It encompasses the entire economy including so-called „**hard-to-abate sectors**“ for which direct electrification with renewables like solar PV is difficult and molecules may be needed.
- Industry:** Steel, chemicals, cement
- Transport:** Aviation, maritime shipping, heavy road transport
- Power sector:** long-term storage
- International hydrogen strategies** identify transport, industry and power. (controversy on passenger cars, building heat due to direct electrification potential)

- WEC (2020): International hydrogen strategies. https://www.weltenergierat.de/wp-content/uploads/2020/10/WEC_H2_Strategies_finalreport.pdf

Power system flexibility with VRE

With wind and solar, the new power system will be based on two technologies that completely change the picture

Example of electricity generation and consumption in a sample week 2023



Fraunhofer IWES (2013)

Specific characteristics of Wind and Solar PV

- 1 Intermittent
- 2 High capital costs
- 3 Very low variable cost

- Wind and solar will be cheaper than any other technologies even when including integration costs.
- The power system and power markets will need to cope with a **highly fluctuating power production** from wind and solar
- To **cost-effectively integrate higher share of VRE**, power supply and demand must respond flexibly to wind and PV energy

“Flexibility is the new paradigm for the power system”

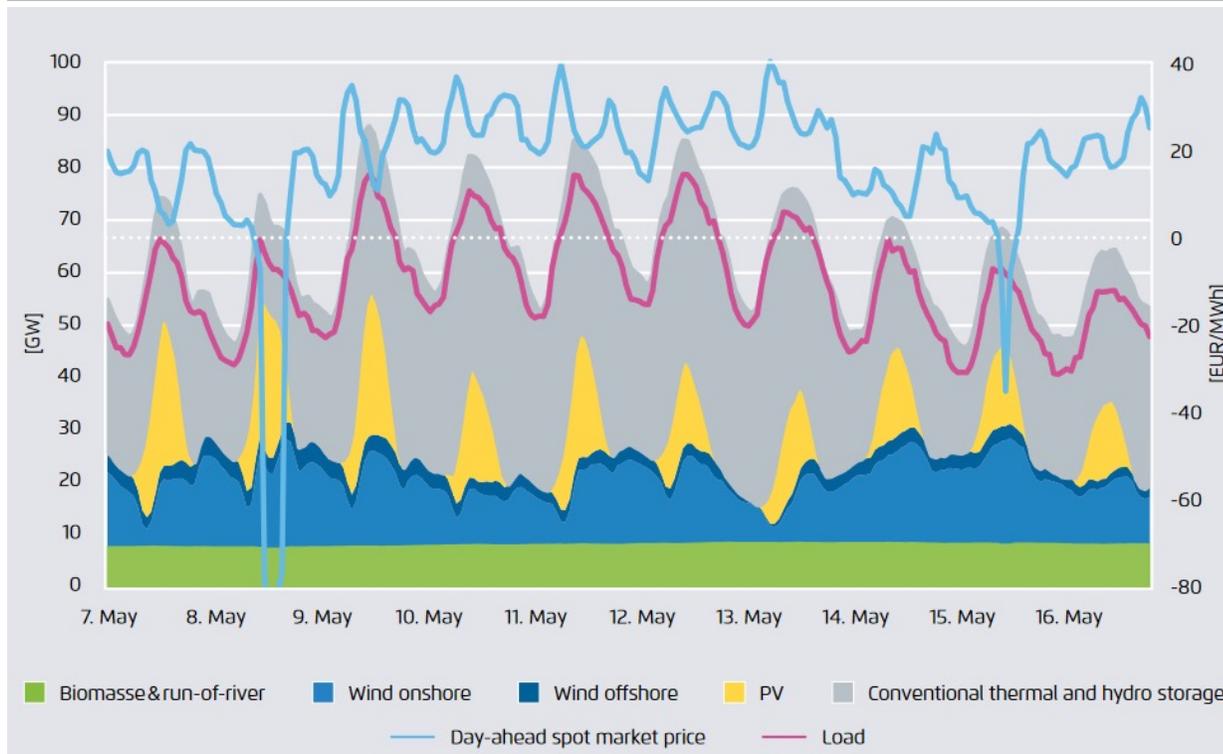
The role of power market for renewable integration

Using the power market to manage the flexibility challenge



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Electricity generation and demand in Germany, 7 to 16 May 2016



Source: Agora Energiewende (2018). A word on flexibility

Key flexibility options

Wholesale power markets are main economic enablers of flexibility, steering dispatch of supply and demand and storage resources

- Prices provide key incentives for plant operators to adjust output and for customers to adjust consumption

Cross-border trade:

- Provide access to the cheapest flexibility option in the region, maximize reliability as a larger pool of resources for system balancing

A shift to more flexible capacity mix:

- Demand-side flexibility (demand response)
- Storage technologies (Batteries, Power-to-Gas)
- Integration of the power, heat and transport sectors (such as power-to-heat, electric cars)

Contact Us

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