International Energy Agency

Integrating renewables through cross-border power trade in ASEAN

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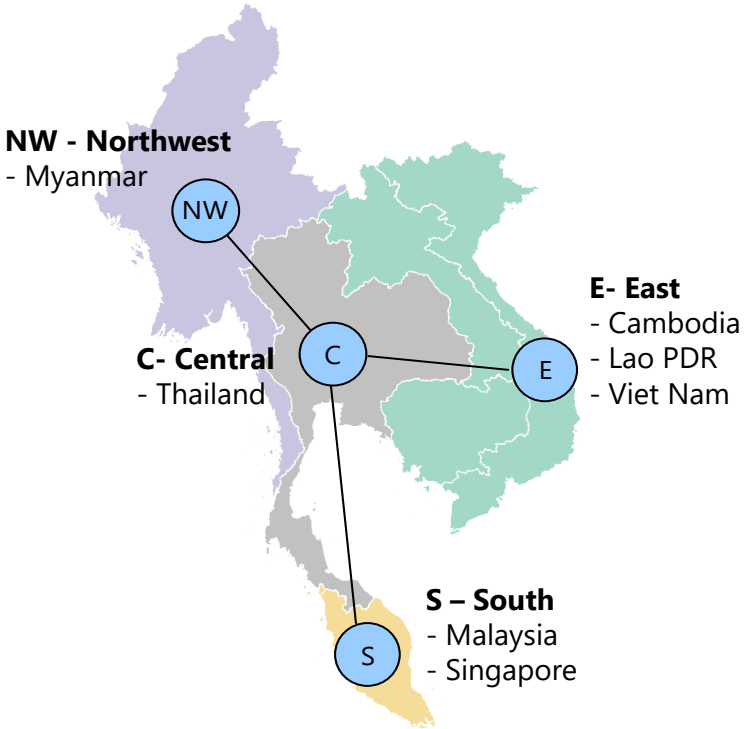
Assessing the value of cross-border interconnections for integrating RE

Four selected transmission zones in the case study



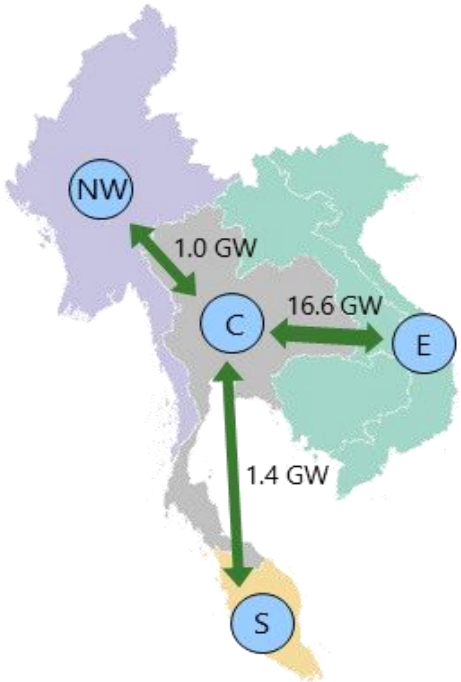
*** Indonesia, Philippines and Brunei are not taken into consideration due to limited resources and availability of data.*

The IEA has conducted a study to assess the value of **cross-border interconnections to accommodate the growing share of renewables** in Southeast Asia

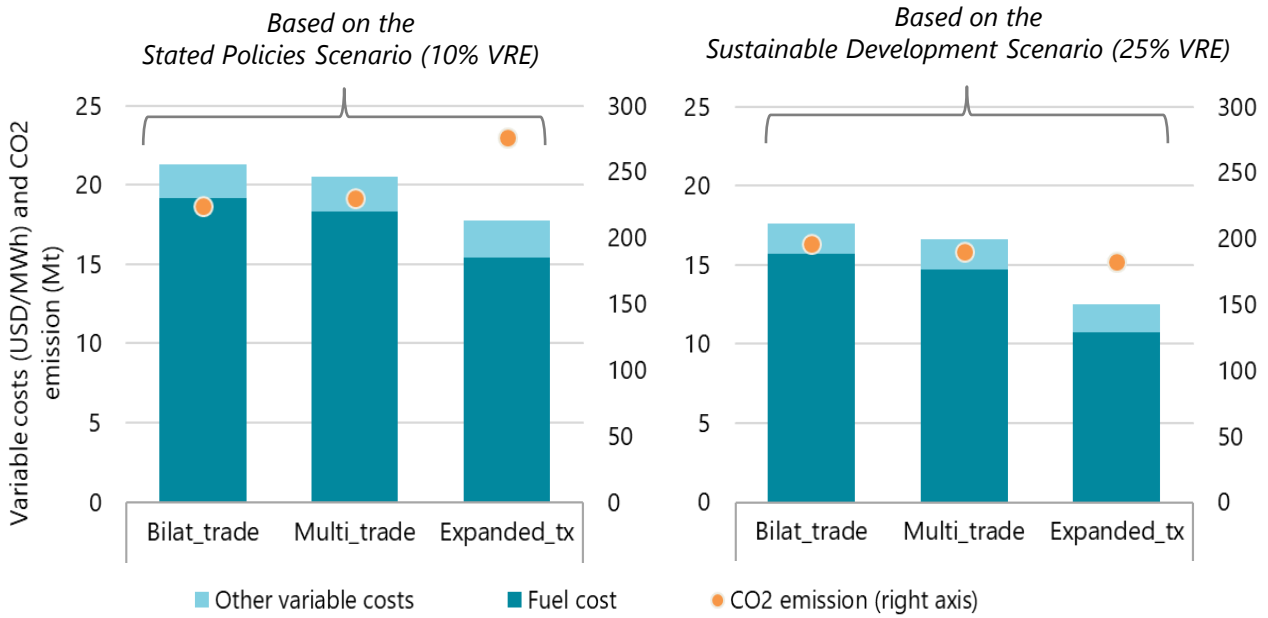
- Hourly dispatch modelling in **2035** based on the scenarios in the 5th ASEAN Energy Outlook (AEO5)
- Highlights various **operational, economic and policy-related** considerations.
- It examines **trade between four regions in Southeast Asia**, with detailed representation of their connections and trade flows.
  - Compare **bilateral trade** arrangement with **multilateral trade** and **expanded trade**

Cross-border power trade can yield a number of benefits

Capacity of the interconnectors



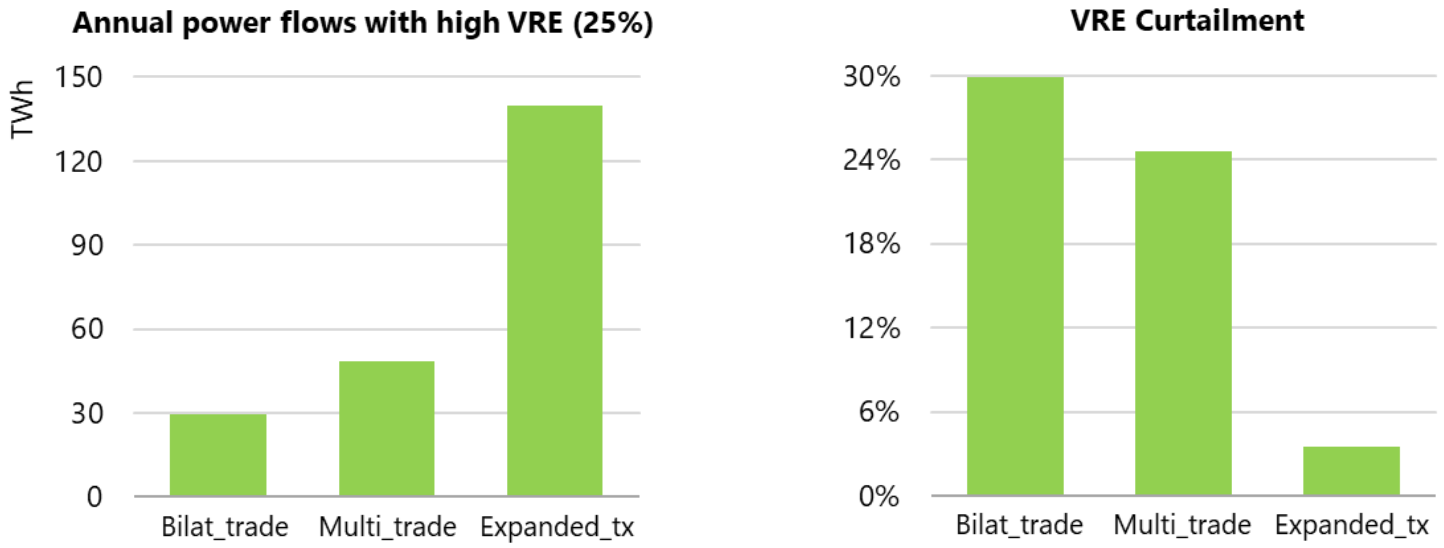
Annual operation cost in 2035



Multilateral trade and expanding interconnectors lead to operational cost savings. It enables the integration of higher share of VRE that provides economic and environmental benefits

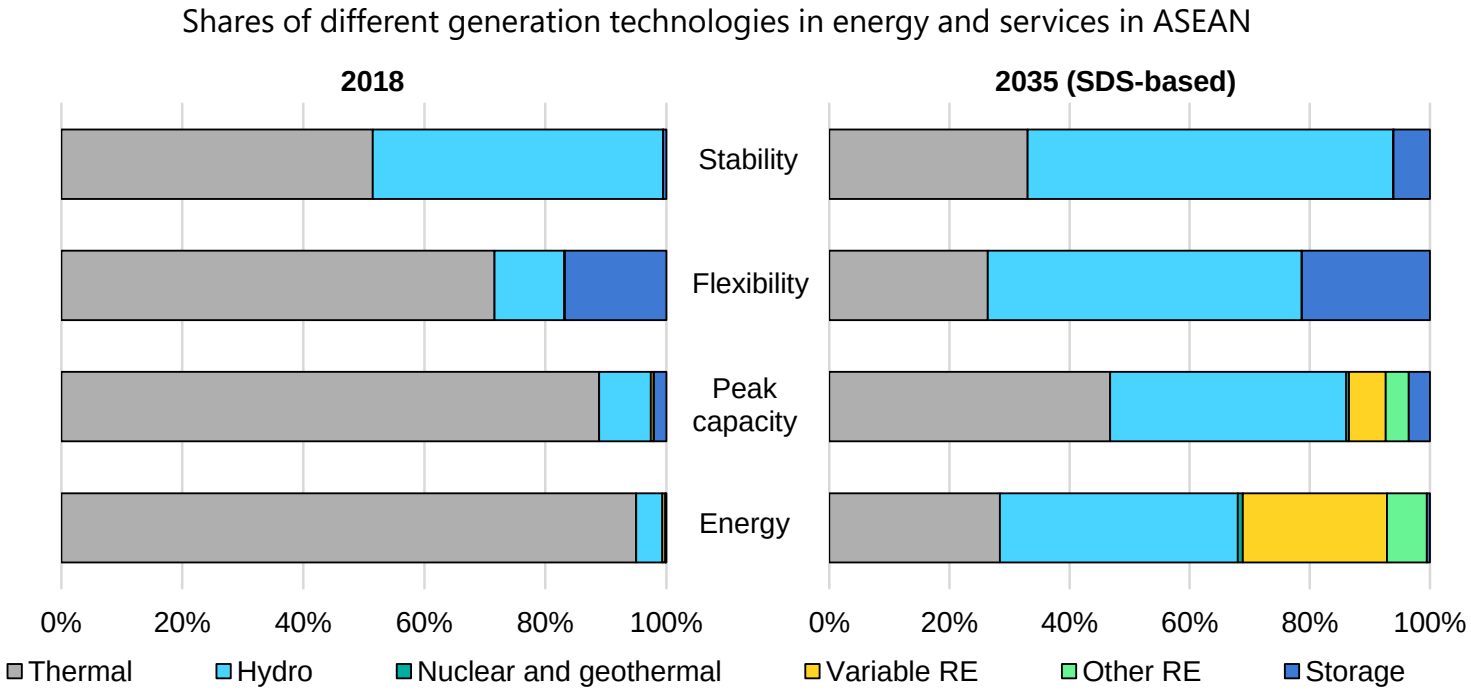
Expanded cross-border trade enables higher VRE penetration

Annual power flows from east to central region (left) and curtailment of VRE output (right) in 2035



Expanded transmission enables greater trade between regions. With high shares of wind and solar PV, expanded cross-border trade is essential to avoid excessive curtailment of their generation

Cross-border interconnections enables resource sharing in ASEAN



Power systems need to reward and incentivise flexibility and capacity contributions of assets and technologies

Benefits of regional connectivity

- Multilateral electricity trade and cross-border interconnections are powerful instruments in the hands of ASEAN policy makers.

- Optimising cross-border flows through multilateral trade – even without any new interconnections – resulted in significantly lower operating costs for the system as a whole via more cost-effective use of the existing transmission links.

- Expanded cross-border connections, together with multilateral trade, are critical to enable cost-effective integration of solar and wind generation
    - resource sharing for common regional benefits
    - Power flows increase from regions with lower generation costs with renewable resources