



ASEAN Centre for Energy
One Community for Sustainable Energy

Coal in ASEAN's Energy Transition: Learning from 2026 Energy Security Issues

The 35th "Clean Coal Day in Japan"
Energy Security with Decarbonisation Symposium 2026
Session-2: New Utilisation of Coal Resources
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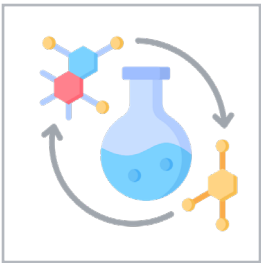


About ASEAN Centre for Energy

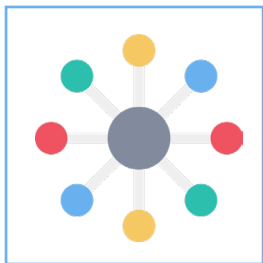
Who are we?

Established on 1 January 1999, the **ASEAN Centre for Energy (ACE)** is an intergovernmental organisation within the ASEAN structure that represents the 11 ASEAN Member States' interests in the energy sector.

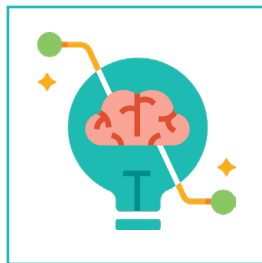
What we do?



Catalyst



Knowledge Hub



Think Tank

Where do we based?

South Jakarta, Indonesia.

ACE's works and the ASEAN regional cooperation activities are planned and implemented based on the blueprint document: APAEC



APAEC is a guiding policy documents serve as the platform for cooperation within ASEAN as well as with dialogue partners and international organisations.

What does APAEC do?

Promoting multilateral cooperation and integration in the energy sector.

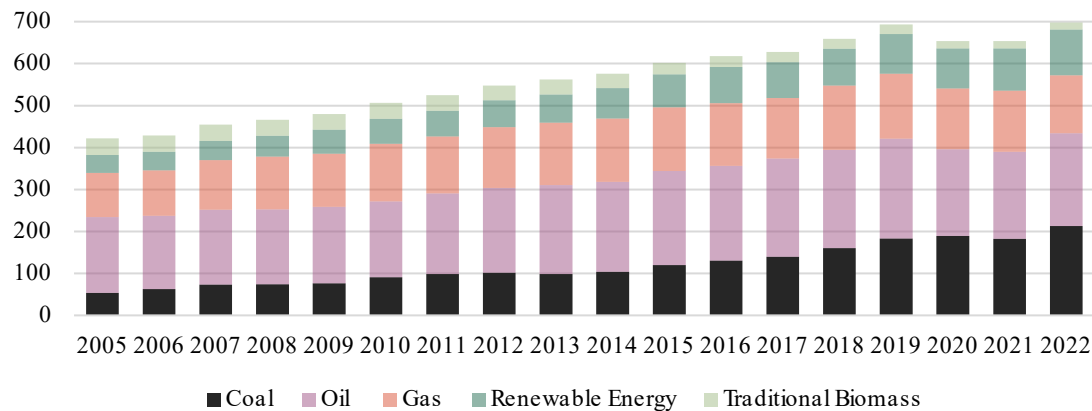
What is APAEC trying to achieve?

To attain the goals of the ASEAN Economic Community (AEC) by enhancing security, accessibility, affordability, and sustainability in the energy sector.

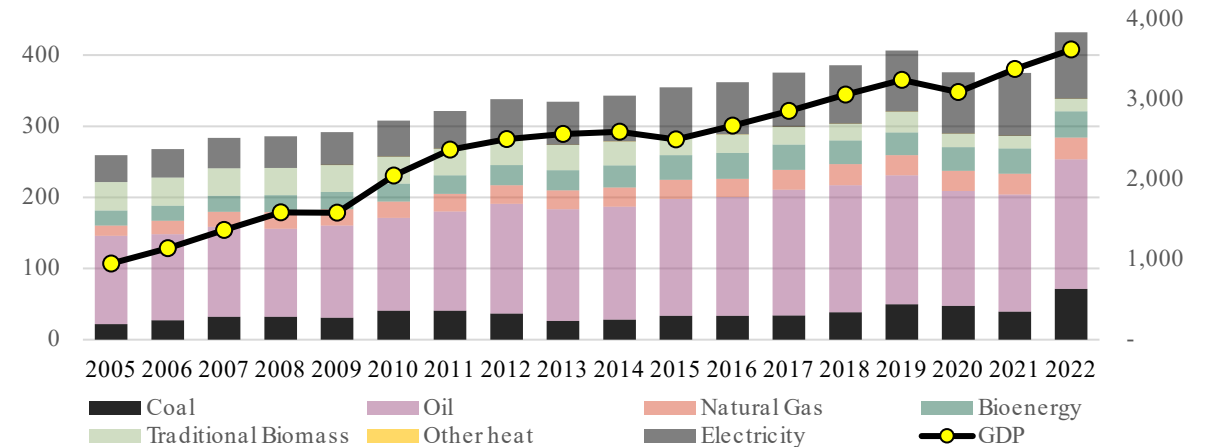
ASEAN Coal Landscape

Supply, Demand, and GDP Growth

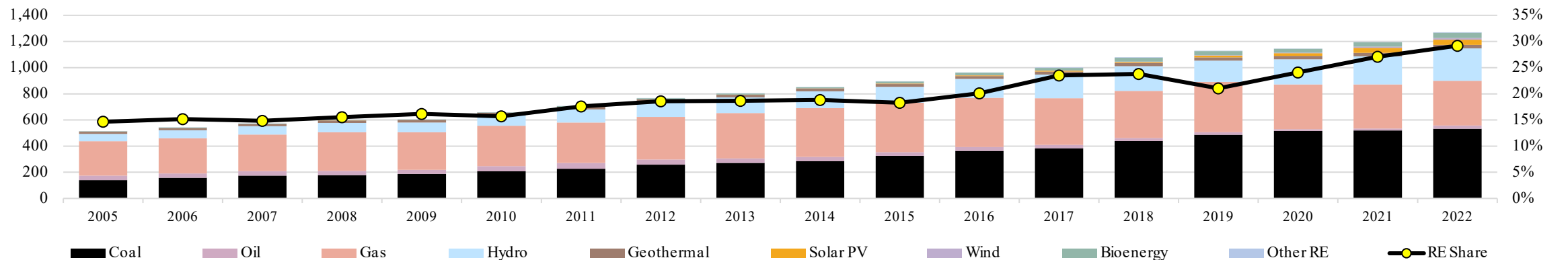
ASEAN Total Primary Energy Supply (2005-2022, Mtoe)



ASEAN Energy Demand (Mtoe, left) and GDP (billion USD, right)



ASEAN Power Generation (2005-2022, TWh)



Source: 8th ASEAN Energy Outlook

2026 exposed the energy security tension around coal

Energy-security issues prompted several AMS to secure, increase or revive coal generation

Philippines declares 'national energy emergency' and boosts coal power as Iran war grinds on

The energy secretary, Sharon Garin, told reporters earlier on Tuesday that with the cost of liquefied natural gas (LNG) soaring, the country would “temporarily” be forced to lean even more heavily on coal.

While hoping to “maximise” the use of local coal, the Philippines was also keeping the option of upping its purchases of coal from top supplier Indonesia, the energy secretary said.

“We talked to the generation companies, the coal-powered plants, to check how much they can increase their generation,” Garin said, calling it a “temporary measure” that could start as early as 1 April.

“If we are successful in implementing this, at least we can decrease the electricity rate hikes because of the conflict in the Middle East,” she said.

Indonesia has assured the Philippines it would place no limits on coal orders, Garin said. “There’s no restriction on our importation of coal from Indonesia as of today,” she said, adding that increased purchases may not be necessary.

Source: [The Guardian](#)

Vietnam leans on coal-power as US-Iran war escalates

Market: Coal | 13/04/26

Vietnam's reliance on coal-fired generation increased in March on stronger electricity demand, with coal output dwarfing other power sources while the Middle East conflict intensified energy security concerns.

The southeast Asian nation's coal-fired output was at 16.09TWh last month, up by 44pc from February — marking its sharpest month-on-month increase in two years and underscoring a push to secure stable power supplies since the outbreak of the war in late February. Coal-fired output was also up by 1pc on the year in March, and accounted for 56pc of total generation, the highest since mid-2025, according to data from state-owned utility EVN. The month-on-month jump was amplified by the nine-day lunar new year holiday in February.

Source: [Argus Media](#)

EGAT seeks alternative LNG supplies, readies Mae Moh plant amid Iran war

The Electricity Generating Authority of Thailand (EGAT) is preparing to rely more heavily on its coal-fired Mae Moh power plant in Lampang, while also seeking alternative liquefied natural gas (LNG) supplies, as it monitors the impact of the Iran war on energy security.

Narin Phaowanich, governor of EGAT, said the agency has set up a dedicated war room to track the situation around the clock, with particular focus on LNG imports from Qatar via the Strait of Hormuz, a key route for fuel used in Thailand's electricity generation.

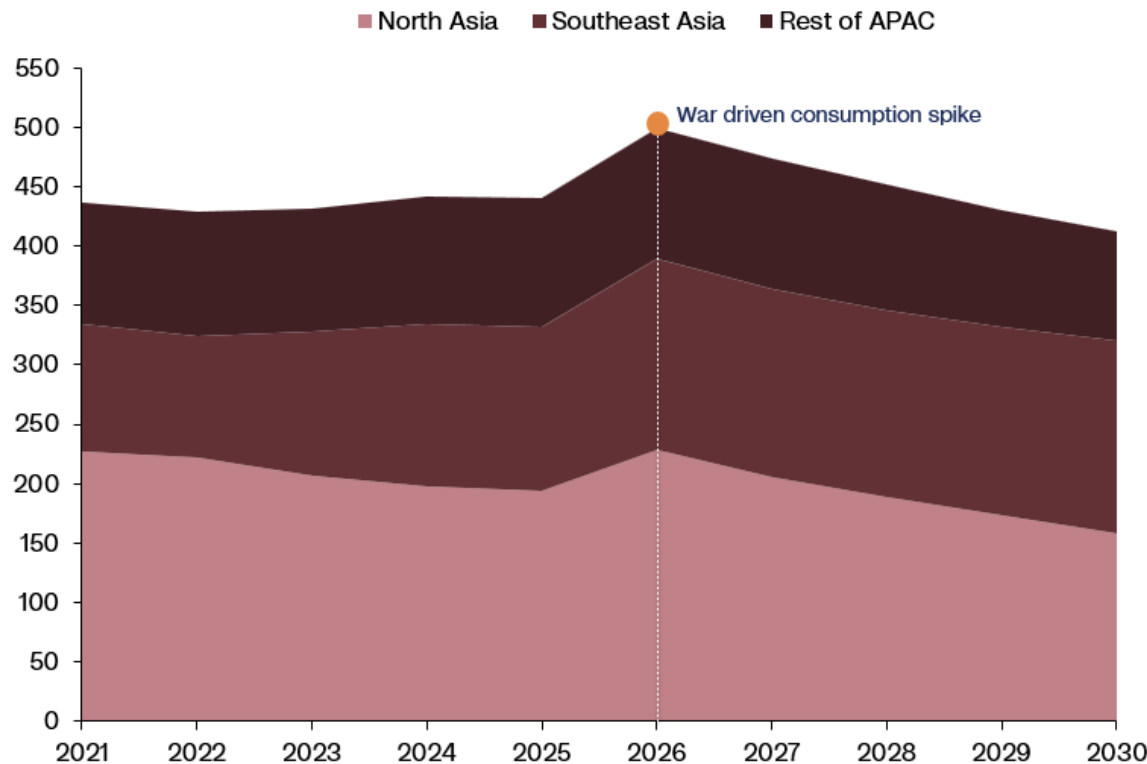
He said EGAT is putting contingency measures in place to cope with any disruption, including securing LNG from other sources and preparing the coal-fired Mae Moh plant to operate at full efficiency.

Source: [Nation Thailand](#)

2026 highlighted ASEAN's dependence on stable coal supply chains

Rising coal demand, supply disruptions and price volatility reinforced the importance of predictable regional coal supply. Particularly, for Indonesia's role as a key supplier.

Thermal coal consumption in Asia Pacific (2026, Mt)



Source: Rystad Energy 2026

Indonesia approves 580 million tonne coal production plan, signals output boost

Source: [The Jakarta Post](#)

With oil prices remaining elevated at around US\$100 per barrel due to supply concerns amid the Iran war, many countries have turned to alternative energy sources, including coal. The increased demand has driven up prices, with Newcastle coal futures rising to \$135 per tonne, about 16 percent higher than before the war.

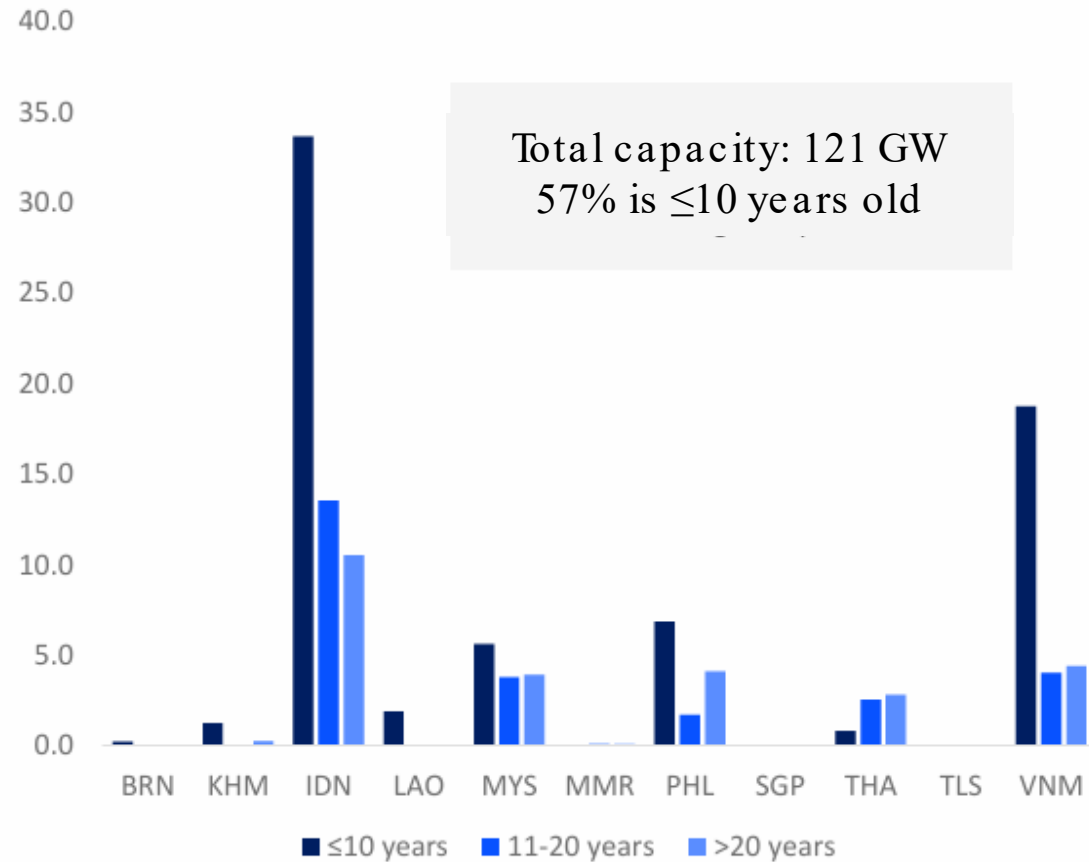
Coordinating Economy Minister Airlangga Hartarto said President [Prabowo Subianto](#) had ordered the administration to **increase coal production volumes** as part of the government's effort to boost state revenue amid rising coal prices.

"The President instructed the government to raise coal output, meaning there will be improvements related to the RKAB," Airlangga said on March 19.

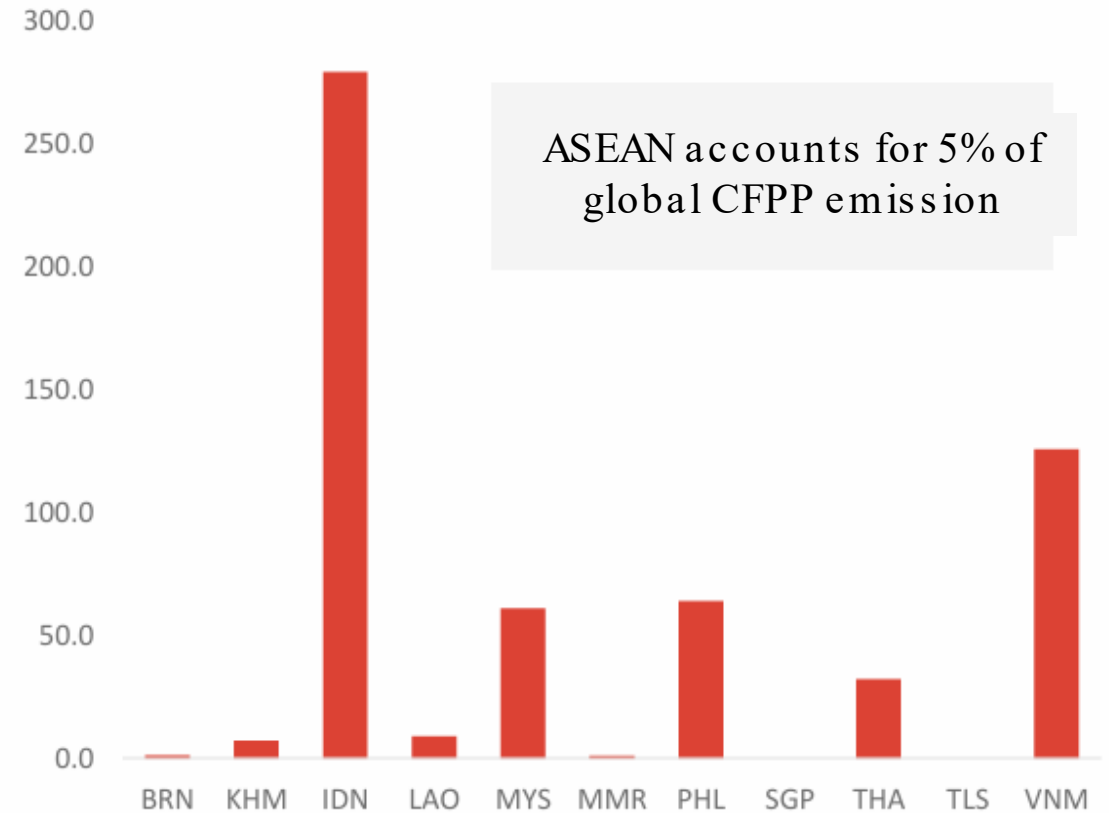
The 2026 shocks reaffirmed coal's near-term reliability role.

With 121 GW of capacity and 57% of the fleet aged ≤ 10 years, ASEAN needs a gradual transition pathways.

Installed capacity by age (2025, GW)

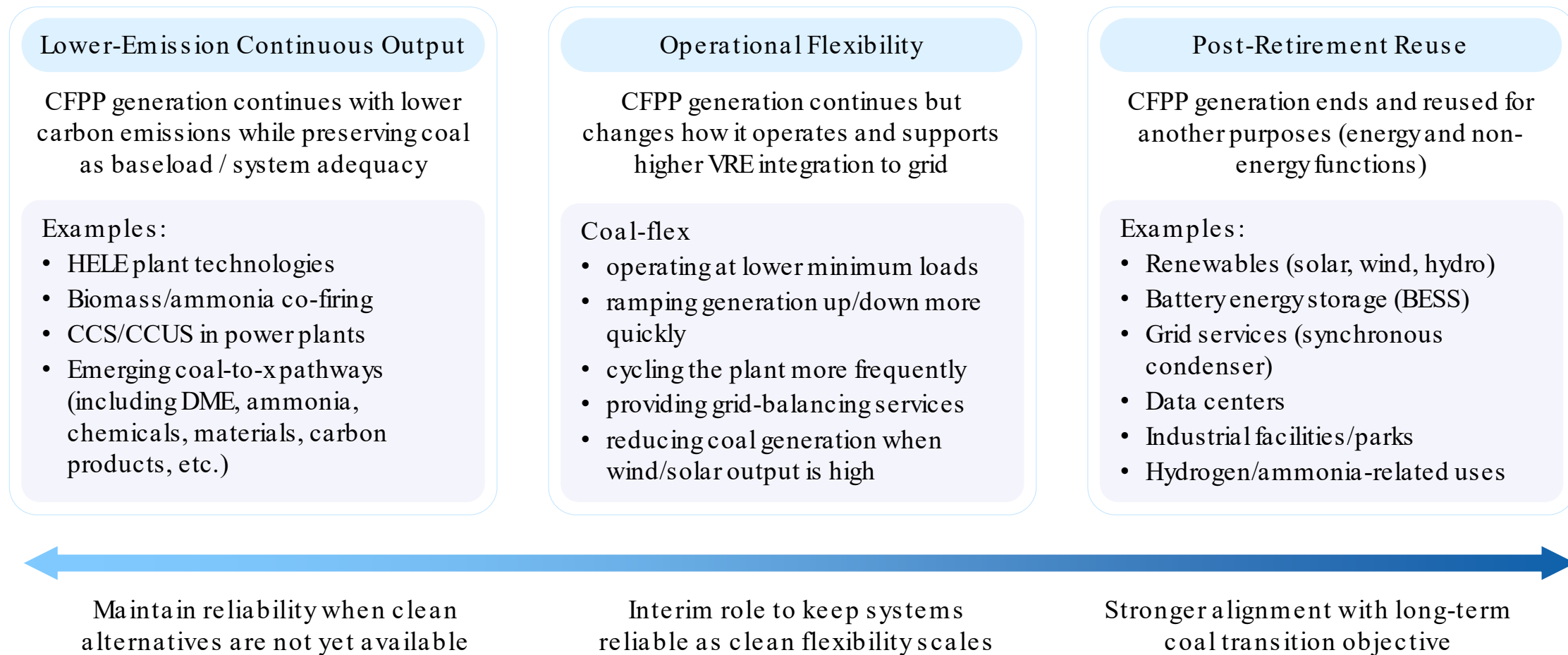


Annual GHG Emission (2025, MtCO₂)



ASEAN's coal in energy transition will require different pathways for different assets

Each asset could have a different highest-value pathways which depends on system needs & local context.



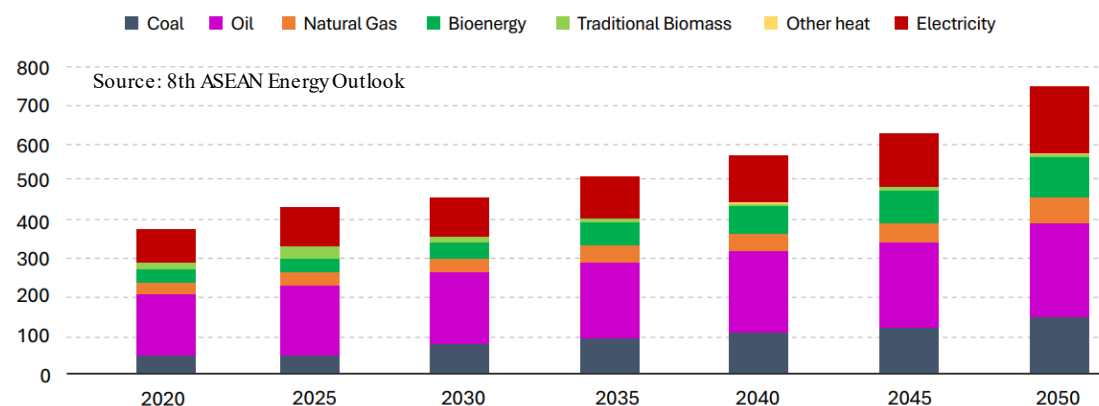
(LECO) should be a targeted measure for assets that still provide system value

For relatively young coal assets that continue to provide reliability value, LECO options can reduce emissions while avoiding premature loss of firm generation capacity.

	co-firing with biomass/ammonia	High Efficiency Low Emission (HELE)	retrofitting with CCS/CCUS
Mentioned/ Discussed by	Indonesia, Malaysia, Thailand, Viet Nam	Indonesia, Malaysia, Philippines, Thailand, and Viet Nam	Indonesia, Cambodia
Technology maturity	● ● ○	● ● ●	● ○ ○
Cost implication	\$\$ - \$\$\$	\$\$\$	\$\$\$\$
Emission reduction potential	Indonesia: 1.05 MtCO₂e per year	1% efficiency → 2-3% CO ₂ emission reduction	Indonesia: 2.12 MtCO₂e per year
Challenges	• Resource availability, land-use concerns (sustainability) • Infrastructure and logistics issues	• Significant upfront investment • Limited technical capacity	• Economic viability • Regulatory gaps • Infrastructure complexity • Cross-border issue

Biomass Co-firing

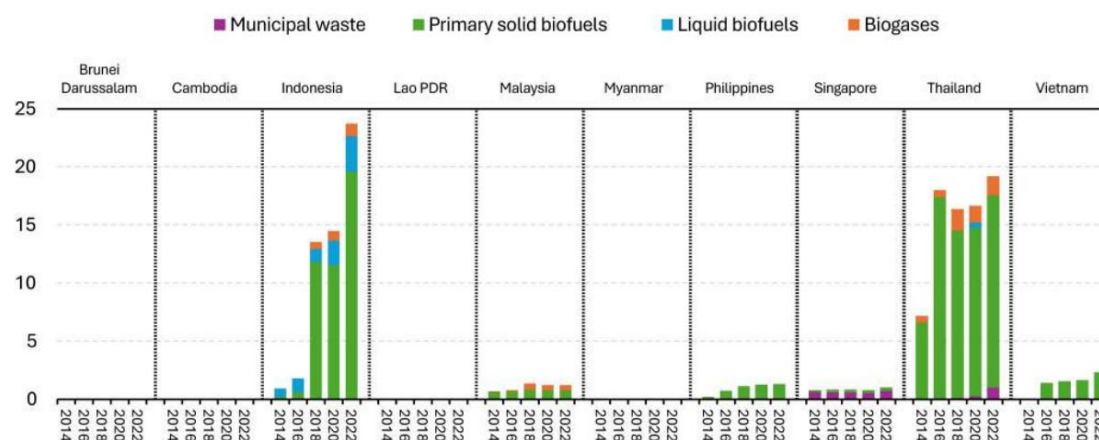
Projections of total energy demand in ASEAN by fuel, 2020-2050 (Mtoe)



Although biomass co-firing has the one of the lowest estimated abatement cost—about USD 20–40/tCO₂ avoided for around 20% co-firing—the following aspects remain challenges to its expansion.

- Immature biomass supply chain: biomass is technically compatible with coal co-firing but making reliable fuel delivery a major constraint.
- Need for fuel processing and plant-specific compatibility: biomass often needs to be converted into pellets, chips, or briquettes to match co-firing system requirements and power-plant capabilities. Different boiler designs may require different types of biomass.
- Higher cost than coal: biomass is described as costlier than coal. In Vietnam, biomass pellets were reported at about USD 100/t, compared with USD 70/t for coal, weakening the profitability of commercial biomass co-firing.
- Responsible biomass sourcing: biomass is only “potentially” carbon neutral. The report stresses that carbon-cycle effects and land-use change must be carefully considered, because poor sourcing can reduce or even undermine the climate benefit.
- Policy and regulatory gaps: high-level targets alone are insufficient. ACE notes the need for detailed regulations, pricing rules, quality standards, reporting requirements, and incentives to make biomass competitive against coal and ensure supply.

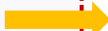
Power generation from waste and biomass in ASEAN by fuel source (TWh)



Source: Transformative Policies to Advance Clean Coal-Fired Power Plants in ASEAN, 2026

Retrofitting with CCUS

Cambodia and Indonesia intended to apply CCUS for power sector application (to CFPP)

	Country	O&G-led application	Industry / hard-to-abate focus	Power sector application	
	Brunei Darussalam				
	Cambodia		✓ Industrial / food-grade CCU	✓ CFPP 	NDC 3.0
	Indonesia	✓ Upstream O&G; EOR	✓ Hard-to-abate industries	✓ Coal power; BECCS / biomass-coal co-firing 	Long-term Strategy for Low Carbon and Climate Resilience 2050 (LTS-LCCR 2050)
	Lao PDR				
	Malaysia	✓ Oil & Gas	✓ Manufacturing industry		
	Myanmar				
	Philippines				
	Singapore		✓ Hard-to-abate sectors		
	Thailand	✓ Upstream O&G; natural gas separation plants	✓ Petrochemicals; cement		
	Timor Leste	✓ Upstream O&G			
	Viet Nam			✓ LNG-to-power with CCS	



~8% contribution
CCS potential to electricity supply by 2050 (AEO8 projection)

Can coal-flex bridge the reliability gap while clean alternatives scale?

Selected coal plants can provide near-term system flexibility as renewables grow, but flexibility must be temporary, targeted and linked to the build-out of cleaner alternatives

Unlike traditional baseload operation, where plants run near full capacity, coal-flex allows coal plants to **increase or decrease generation output more quickly** in response to fluctuations in grid demand and variable renewable energy (VRE) output across hours in the day and seasons in the year.

Illustration of technical parameters for coal flexibility

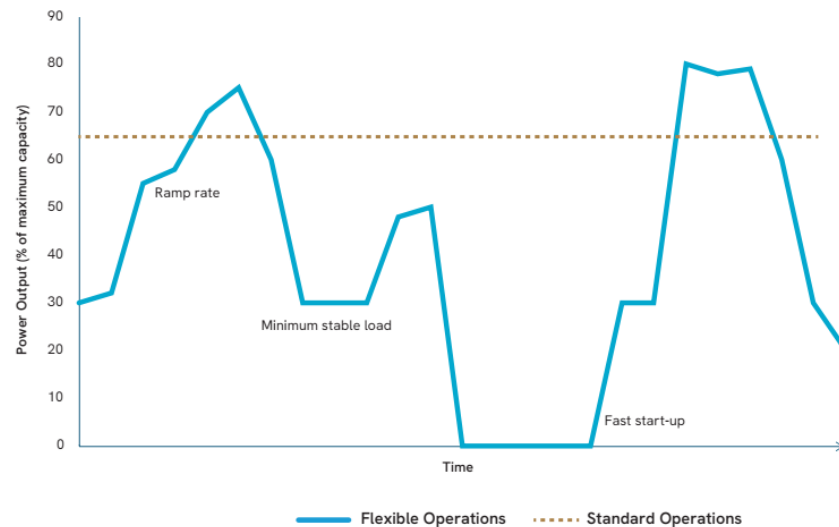
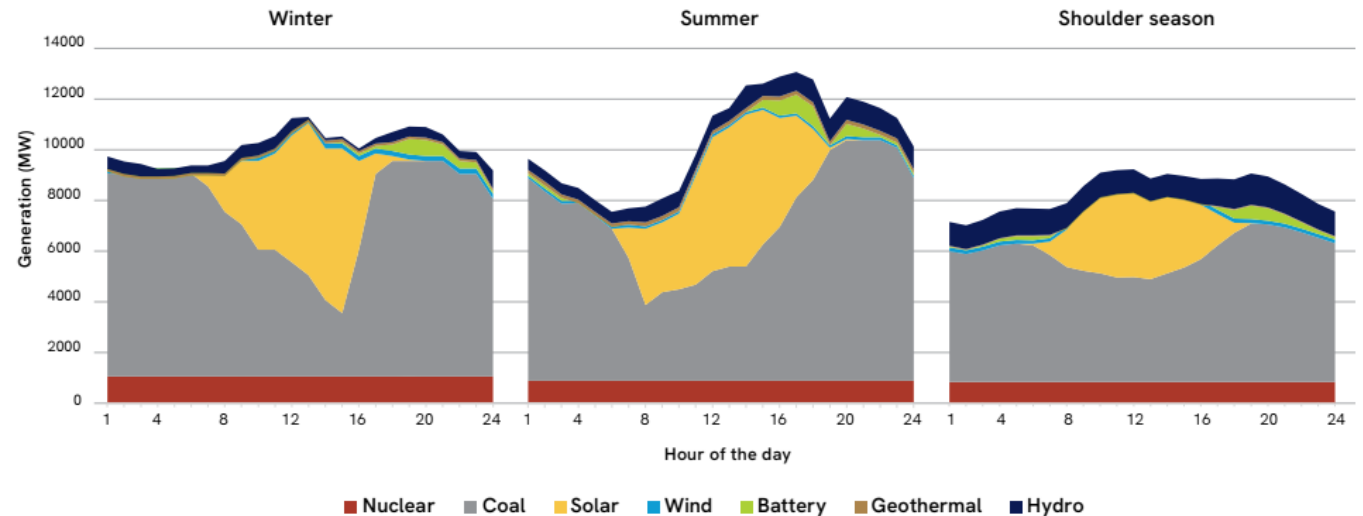


Illustration of intra-day and seasonal coal flexibility



- Coal flex becomes relevant as rising demand and VRE penetration increase flexibility needs before clean alternatives are fully available.
- However, it should be temporary and targeted to bridge the system towards clean flexibility.
- Flexibility does not automatically mean decarbonisation: lower-load operation can reduce efficiency and increase emissions intensity.

Repurposing coal assets can unlock new value from existing infrastructures

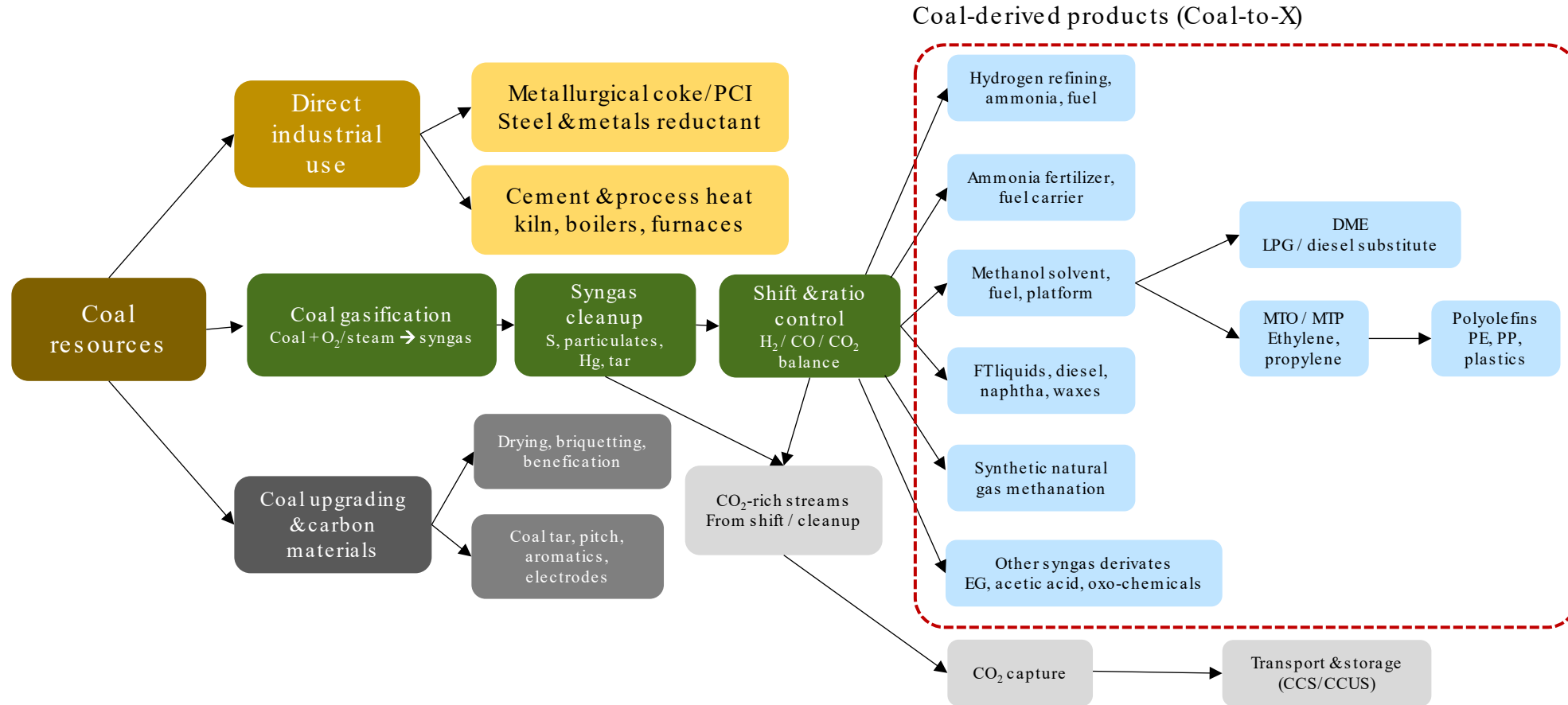
Repurposing separates the coal plant's generation function from its underlying site, grid connection and infrastructure to allow these assets to support new energy & non-energy uses.

Category	Repurposing Options	Technology Maturity	Cost Level	ASEAN Applicability	Challenge
Clean Energy	Solar PV/ Wind	● ● ●	\$ - \$\$	□ □ □	Large land needs (larger than coal sites area), intermittency
	Biomass or Waste-to-Energy (WTE) Plant	● ● ●	\$\$ - \$\$\$	□ □	Sustainability of feedstock
	Small Modular Reactors (SMRs)	● ● ○	\$\$\$	□	Regulatory readiness, long lead time
	Abated CCGT (100% H ₂ or CCS-equipped)	● ○ ○	\$\$\$	□	High fuel cost, low maturity
Grid Services	Battery Energy Storage System (BESS)	● ● ●	\$\$	□ □	Limited storage duration
	Synchronous Condensers (SynCons)	● ● ●	\$ - \$\$	□ □	No power generation
Non-Energy	Industrial Facilities / Data Centres	● ● ●	Project-specific	□ □ □	Demand and investment dependent
	Housing / Community / Cultural Center	● ● ●	Project-specific	□ □	Site remediation costs

Note: ● ● ● Commercially deployed ● ● ○ Early commercial ● ○ ○ Demonstration

Coal Beyond Combustion

In growing economies, coal is expected to remain a key feedstock for producing various chemicals and fuels, collectively referred to as “Coal-to-X”





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