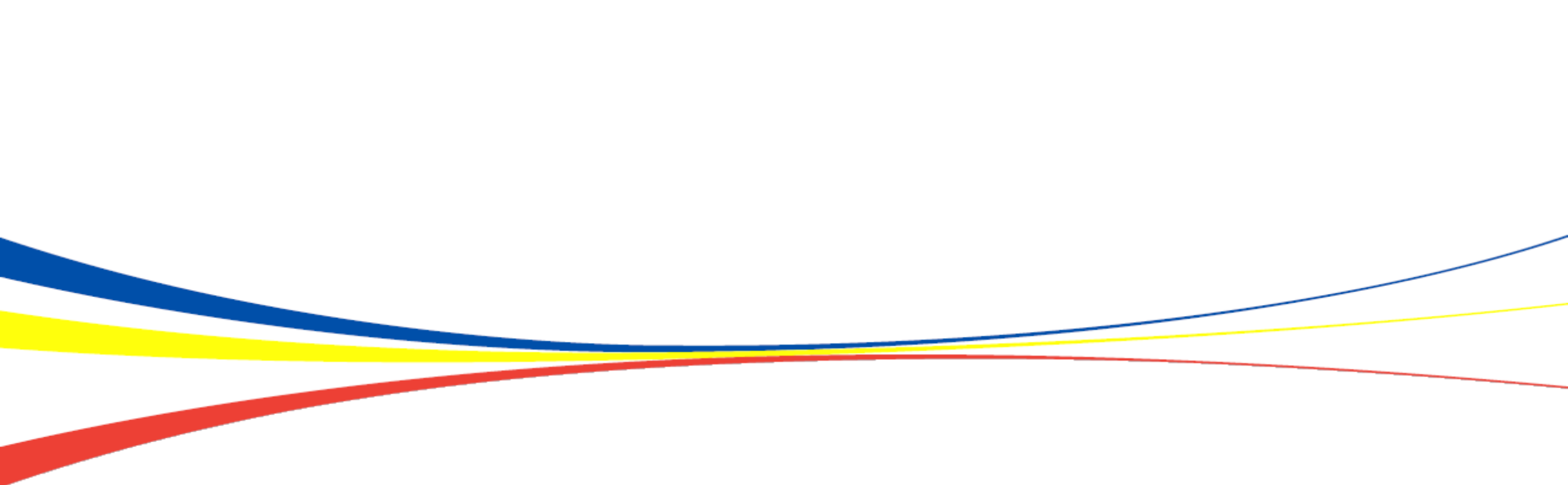




NDCs, APAEC and Innovation in the ASEAN Energy Transition

SIEW Think Tank Roundtable 2021

"Innovation to Accelerate the Energy Transition in the ASEAN"

28 October 2021, 09:30 AM - 11:30 AM (GMT +8)

Contact: accept@aseanenergy.org, pfs@aseanenergy.org



**One Community
for Sustainable
Energy**

NDC Submissions ahead COP26

5 ASEAN Member States (AMS) submitted NDCs in 2020, remaining 5 in 2021.
Latest NDCs reflects more **ambitious commitments**.



Mitigation targets



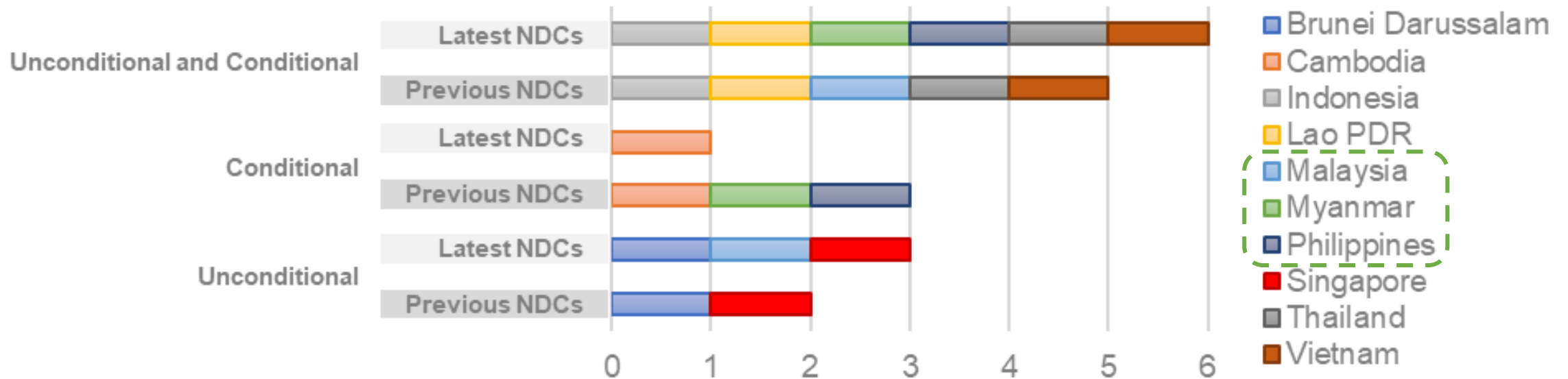
Conditionality status



Wider coverage of GHGs and sectors

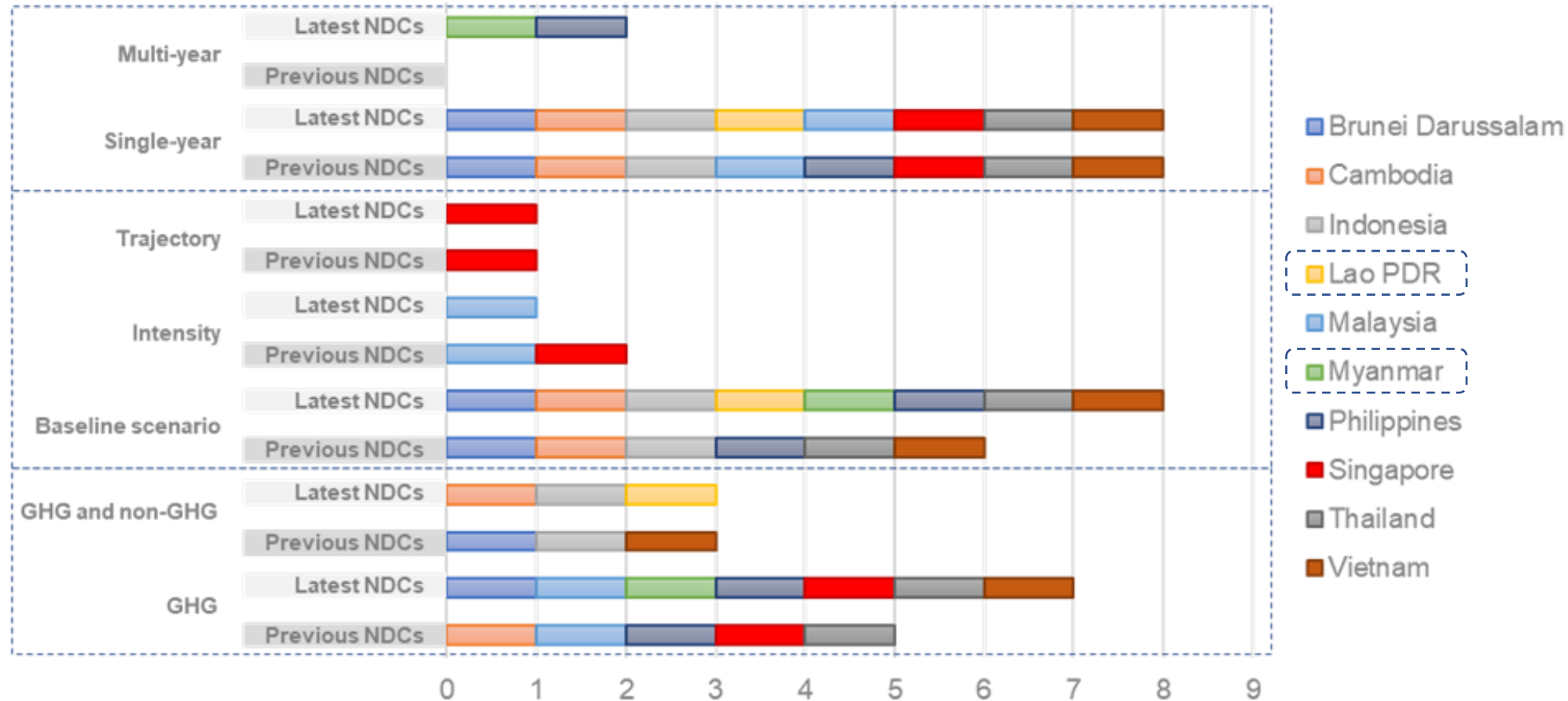
Conditionality of NDCs

Three (3) AMS upgraded their conditionality status while the rest kept the conditionality of their NDCs.



Mitigation targets of NDCs

Observation based on three (3) categories: (1) GHG vs non-GHG, (2) Baseline, Intensity, vs Trajectory, (3) and Single-year vs Multi-year.



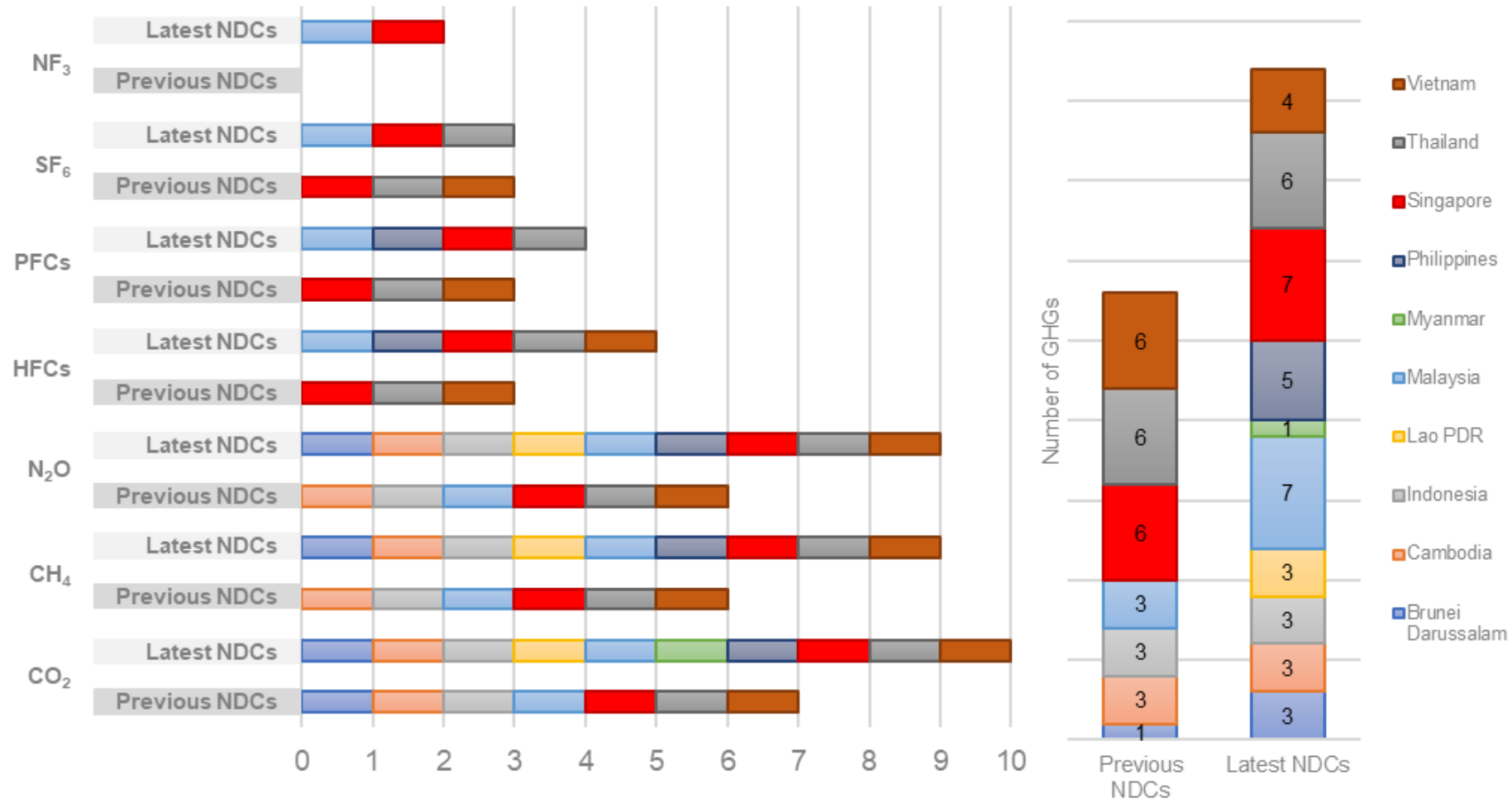
Mitigation targets of NDCs

The projected baseline emissions indicate the increased emission reduction commitment.

Emissions reduction (MtCO ₂ e)	Unconditional		Conditional	
	Previous NDCs	Latest NDCs	Previous NDCs	Latest NDCs
Brunei Darussalam	N/A	5.90	N/A	N/A
Cambodia	N/A	N/A	3.13	27.09
Indonesia	832.01	No change	1,176.29	No change
Lao PDR	N/A	62.40	N/A	N/A
Malaysia	0.531 tCO ₂ e / thousand Malaysian Ringgit			
Myanmar	N/A	244.52	N/A	414.75
Philippines	N/A	90.52	N/A	2,414.70
Singapore	0.113 kgCO ₂ e/SD and peaking at 65 MtCO ₂ e			
Thailand	111.00	No change	138.75	No change
Vietnam	62.99	83.51	196.85	250.53

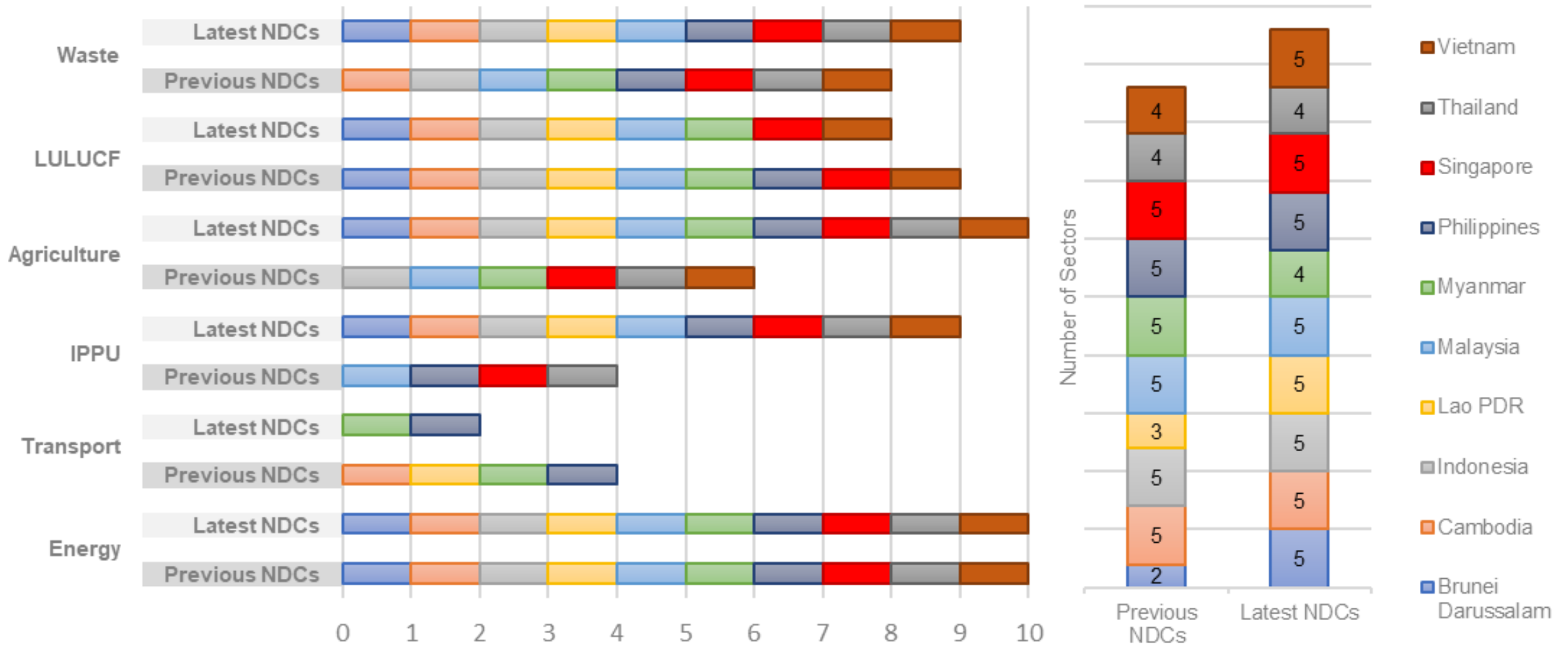
GHGs coverage

All AMS included CO₂, nine (9) AMS included CH₄ and N₂O, 4 – 5 AMS included PFCs and HFCs, and 2 – 3 AMS included SF₆ and NF₃.



Sectors coverage

The 8-9 AMS have economy-wide coverage and adopted IPCC sector classification .



Towards COP26

Strengthened regional cooperation to mitigate climate change and maintain the energy security and resilience.

Joint Ministers Declaration

Shared commitment and responsibility to maintain energy security and energy transition

Articulated the need of financial, investment, technical, cross-sectoral approach, and cross-pillar support

NDC Submissions

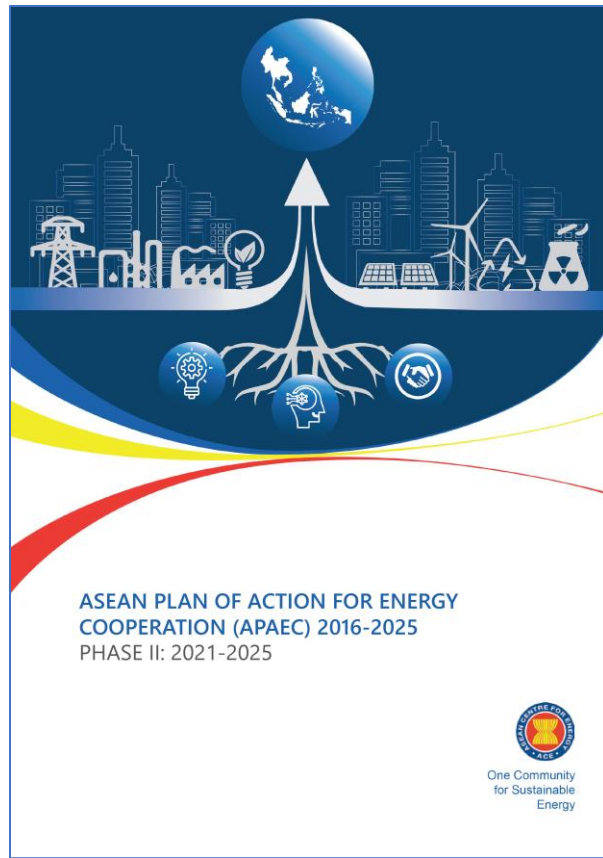
Alert the severity of climate impacts in region

Emphasis the urgent need of international support

Clear stance on voluntary cooperation of Article 6, e.g., market-based mechanisms (carbon tax, ETS, carbon offsets)

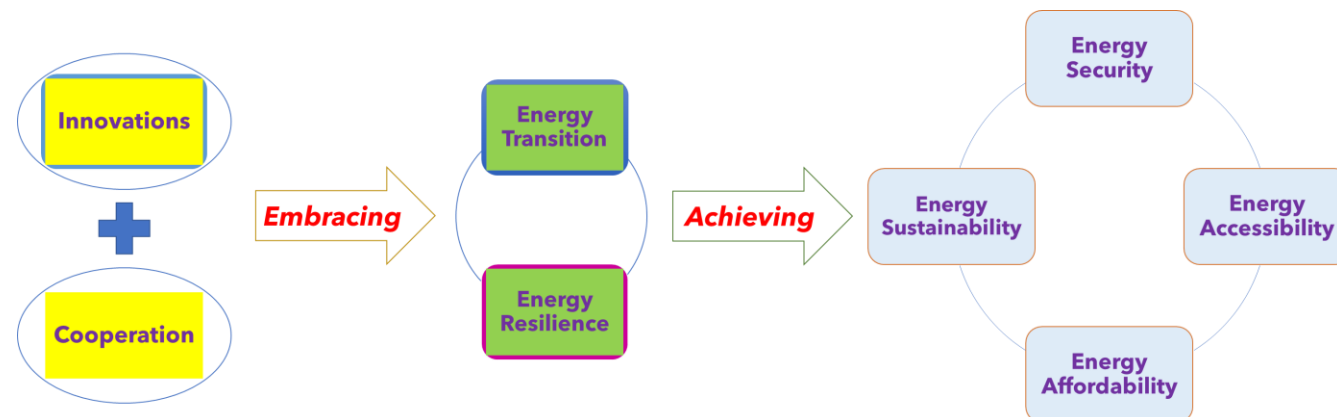
The APAEC Phase II: 2021-2025

Regional blueprint for the energy cooperation in the ASEAN that builds on the success of APAEC Phase I: 2016-2020, sets out ambitious targets and initiatives to enhance energy security and sustainability and supports the UN SDG7.



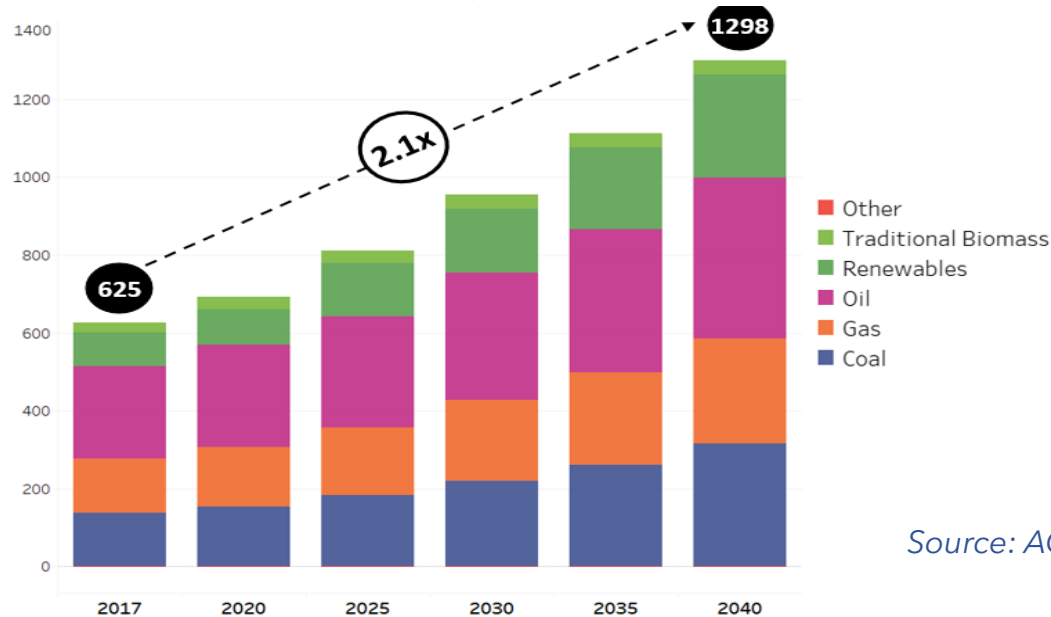
ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025 Phase 2: 2021-2025

- **Theme:** “Enhancing Energy Connectivity and Market Integration in ASEAN to Achieve **Energy Security, Accessibility, Affordability and Sustainability** for All”.
- **Sub-theme:** “Accelerating Energy Transition and Strengthening Energy Resilience through Greater Innovation and Cooperation.”



Future Energy Landscape in ASEAN

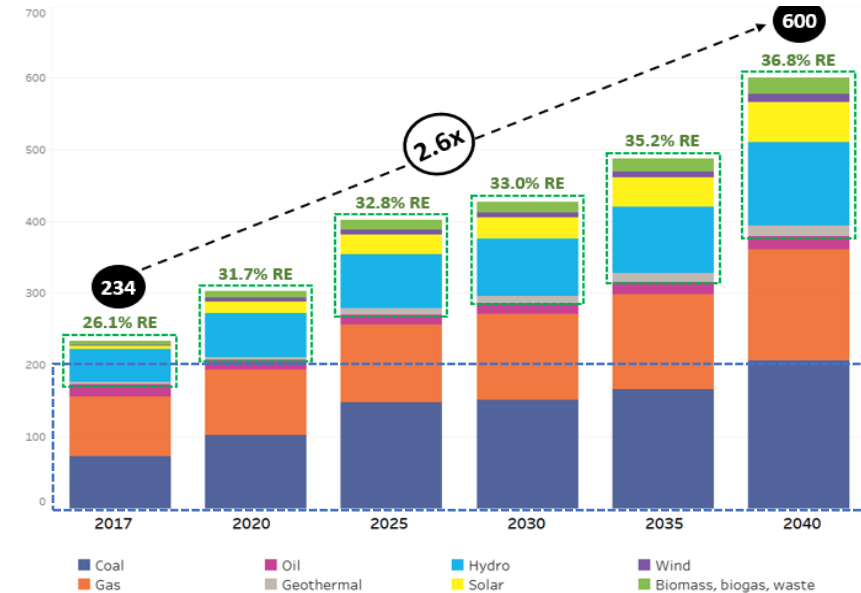
Higher penetration of solar and wind energy, the **role of coal and natural gas will be essential** to maintain grid stability and to secure energy supply.



Source: ACE, 2020

ASEAN Total Primary Energy Supply under the ATS (MTOE)

- ❑ The **economic growth** of ASEAN has been one of the **most dynamic** and the **fastest in the world**.
- ❑ Fueling this growth, is the increase of energy demand.
- ❑ Demand in primary energy in **2040** is expected to be **2.1 times higher** than the **2017 level**



ASEAN Total Installed Capacity under the ATS (MW)

- ❑ ASEAN countries **acknowledges** the need for transitioning into **low-carbon economy**
- ❑ **Existing policies** implemented by AMS has **driven large uptake of renewables** in past years, and is **expected** to drive **increase in RE installed capacity** in the long-term
- ❑ However, **fossil-based generation** is still expected to **dominate the energy mix** in the region to **secure its energy supply**

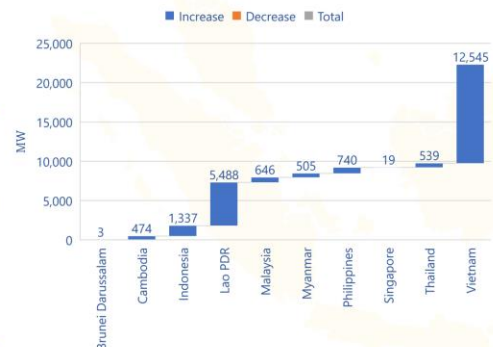
RE share was 33.5% in 2020, only 1.5% gap from 2025 target

Most of the increase in RE has been in hydro and bioenergy; solar and wind began to increase sharply in 2015. Despite different RE potential among the AMS, all their shares of RE increased.

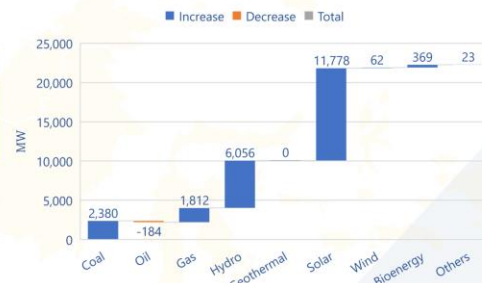
Approximately 22 GW of capacity was added in 2020

- ❖ About 82% of the ASEAN new capacity in 2020 was renewable (a notable new trend).
- ❖ Lao PDR created new hydro capacity, while Vietnam significantly increased its solar capacity.

Additional ASEAN Installed Power Capacity in 2020, compared to 2019, by country



Additional ASEAN Installed Power Capacity in 2020, compared to 2019, by source



ASEAN Power Updates | September 2021 | ACE. All rights reserved.

Eager for energy transition, AMS continue to install RE

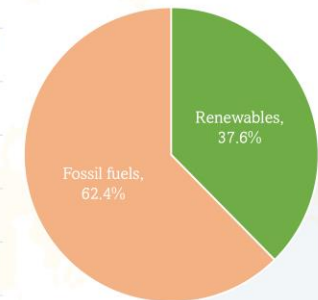
- ❖ More than 60% of the newly installed capacity up to 2025 will be coming from renewables.
- ❖ This will mean a 37.6% share of RE in 2025, which is 2.6 units above the regional target.

Projected Additional Installed Power Capacity, 2021 to 2025 by source



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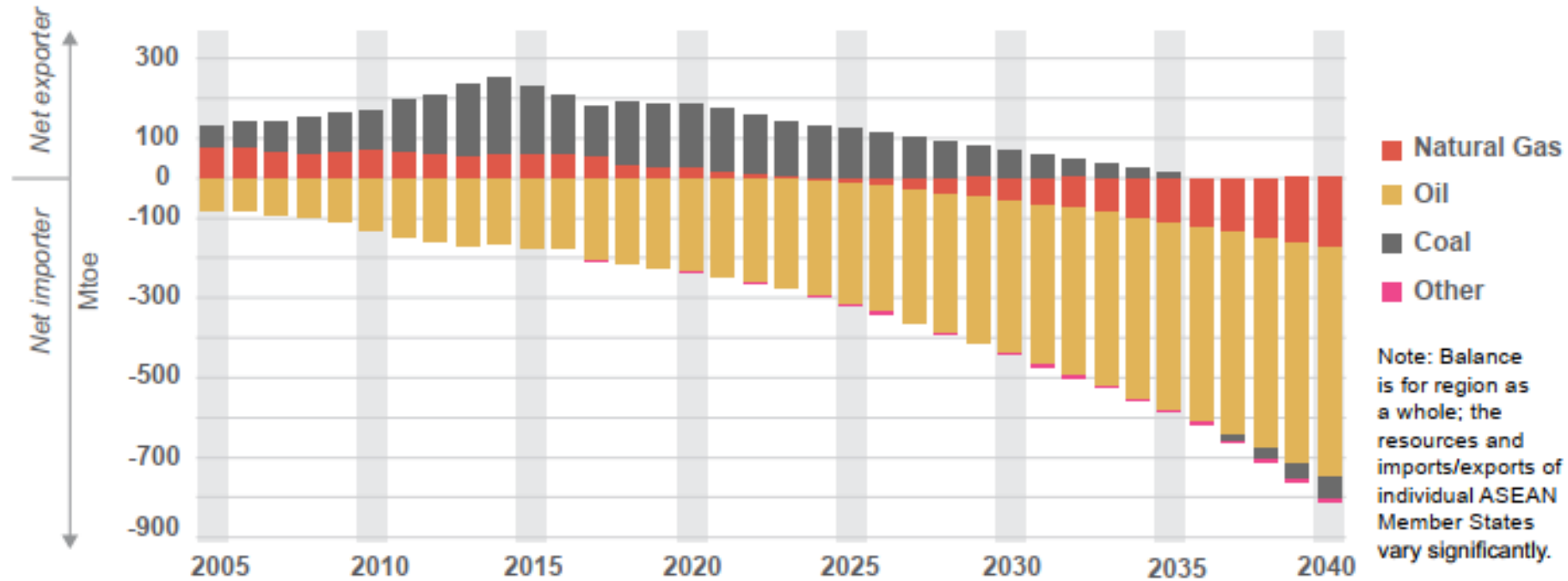
Fuel share in 2025



Source: ACE, 2021

ASEAN Energy Import-Export Balance and Projections

Without significant discoveries and exploitation of domestic resources, ASEAN will become net-importer of gas starting 2025 and coal starting 2035.



- With a growing reliance on fossil fuel imports, by 2040, ASEAN could face serious energy security challenges in the Baseline Scenario.
- Fossil fuel markets are volatile, and fluctuating prices could affect the affordability of fuels needed by the ASEAN economies.

Source: ACE, 2020

Five Things to be Considered by ASEAN Policy-makers

We explored the key paths to address energy issues and policy challenges in ASEAN region which are aligned with the themes of APAEC Phase II: energy transition, resilience and sustainability.



ASEAN Power Grid

By enabling more cross-border trade, a more interconnected ASEAN could make large-scale RE investments more profitable. Power connectivity through the APG can enable more efficient use of resources, enhance grid stability and service in remote areas, and improve the region's energy security.



Continuation of Fossil Fuels

Along with stepped-up efforts to reduce fossil fuel demand through fuel-switching and energy efficiency measures, AMS can work to reduce GHG emissions and other externalities by deploying technologies such as fuel-switching by applying LNG-to-Power, coal upgrading; HELE coal power; co-firing systems; and CCUS.



Efficient Air Conditioners

Energy demand for cooling in ASEAN has been rising rapidly over the past three decades. Policy-makers will need to find ways to ensure that the expected increase in cooling demand and AC ownership is sustainable as well as consider consumer incentives and education.



Greener Transport

In 2017, the transport sector was responsible for 26% of TFEC and 23% of GHG emissions in ASEAN. Two key approaches, adoption of electric vehicles and substitution of oil products with biofuels, can help Member States to reduce oil import dependency and improve energy security.

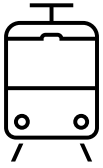


Clean Cookstoves

There are still many ASEAN people that still cooked with traditional biomass, exposing themselves to dangerous levels of indoor air pollution. The use of electric cookstoves may be promising for the future, particularly in urban and peri-urban areas where electricity access is expanding.

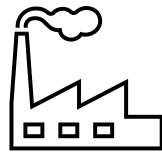
Policy Implications and Recommendations

The 6th ASEAN Energy Outlook (AEO6) identified the recommendations for some key energy-consuming sectors to accelerate the transition to cleaner, more sustainable energy through targeted policies.



Transport

Adopt stronger demand- and supply-side policies for both biofuels and electric vehicles; keep pursuing the vehicle efficiency target in the ASEAN Fuel Economy Roadmap; strengthen vehicle emission and fuel quality standards; and invest in public transit and non-motorised transport to reduce the need for driving.



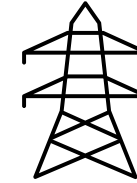
Industry

Given that industry is the sector with the highest energy demand in the region, it is crucial to adopt ambitious energy efficiency measures and emission standards. Manufacturers should also be strongly encouraged to adopt renewable energy – biomass may hold the greatest promise.



Residential and Commercial

Stronger energy efficiency requirements for buildings, enhanced building codes and stricter efficiency standards for appliances can all help slow energy demand growth driven by rising incomes.



Power

Invest in grid improvements and technologies such as demand-side management and energy storage systems to facilitate the integration of renewable energy into the power grid; strengthen emission standards for power plants to reduce GHG emissions and protect public health.

Innovations in Energy Transition

The solution is again human ingenuity and innovation, but a key question is where to focus the innovation efforts and defining their strategies to decisively fight climate change.

Technological

- **R&D Establishment:** Covered activity to bridge "Lab-to-Market".
- **Improved Technology:** Enhanced performance, material utilization, energy efficiency improvements, cost reduction, stimulate deployment.
- **Grid integration:** Establish interconnection between countries or region.
- **Digitalisation:** Bring Internet-of-Things (IoT) concept and Information Technology advancements.
- **Maturing emerging technology:** Developing hydrogen and CC(U)S that include feasibility study and further R&D to seek lower investment cost.

Financial

- **R&D Funding:** Allocate the budget (from national or grants) to conduct R&D activity.
- **Business Model:** To attract the investment on RE, RE developer could be granted with special tax rate or by giving the incentives. Empowering the customers or citizens to actively participate in the market, could also be conducted, while also supporting start-up and local RE companies.
- **Market Design:** Design regional energy market, by making cross-border electricity transmission to allow export-import energy, integration with gas market, and implement merit order for flexible market. Set pricing mechanism by nodal/zonal prices or price signal within the region.

Policy and Process

- **Policy Framework & Government Support:** It needs to be established to anchor the future, thus reducing the uncertainty. The government needs to support the establishment and the implementation of intended policies and regulations.
- **Carbon Pricing:** Think to enforce carbon pricing or carbon tax to flourish the development low-carbon technologies.
- **Collaboration:** Seeking for international and regional collaborations to strengthen the capability and financial support. Active engagement with private sectors to deploy the technologies. Implement triple helix collaboration and build networking for knowledge sharing and information exchange.
- **Social Awareness:** Having impactful media campaign and education could boost the awareness.

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