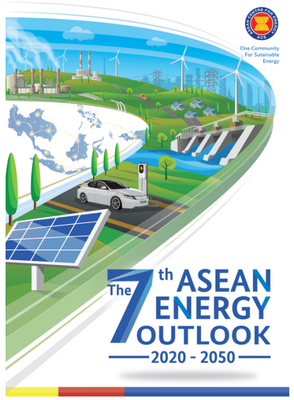


The 7th ASEAN Energy Outlook Dissemination to Malaysia

Organised by Institute of Energy Policy and Research (IEPRe) in collaboration with ASEAN Centre for Energy (ACE)

Welcoming remarks by:

PROF. DATO' TS DR. MOHD ZAMRI YUSOFF

Deputy Vice-Chancellor (Research & Innovation), UNITEN

MS RIKA SAFRINA

Senior Officer
Energy Modelling and Policy Planning (MPP) Department

DR ZULFIKAR YURNAIDI

Manager
Energy Modelling and Policy Planning (MPP) Department

10 MAY 2023
WEDNESDAY
2 PM - 3.30 PM

HYBRID MODE

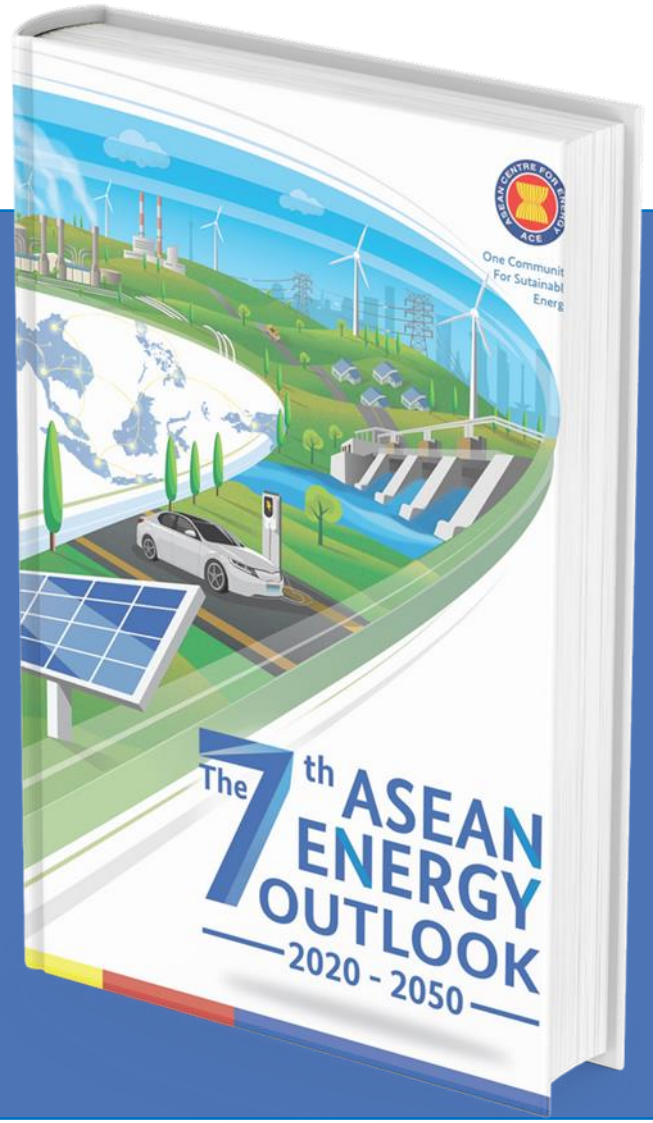
Online:
Ms Teams

Venue:
Seminar Room BA-4-027 (Paris), Level 4, Administration Building, UNITEN

AEO7 Dissemination Seminar

Introduction to ASEAN Energy Outlook and Its Roles in Regional Energy Cooperation

Dr Zulfikar Yurnaidi
Manager, Energy Modeling and Policy Planning (MPP)
ASEAN Centre for Energy (ACE)



ASEAN Centre for Energy (ACE) – Roles and Responsibilities

Intergovernmental organisation within ASEAN structure that represents the 10 ASEAN Member States' interests in the energy sector.

As a Think tank..

Conduct studies and provide policy recommendations

..Catalyst

Collaborate with national, regional, and international entities

ASEAN+3

ASEAN+6

IEA

ECCJ The Energy Conservation Center, Japan

USAID FROM THE AMERICAN PEOPLE

한국에너지공단 KOREA ENERGY AGENCY

..and Knowledge hub

Data and knowledge repository and analysis

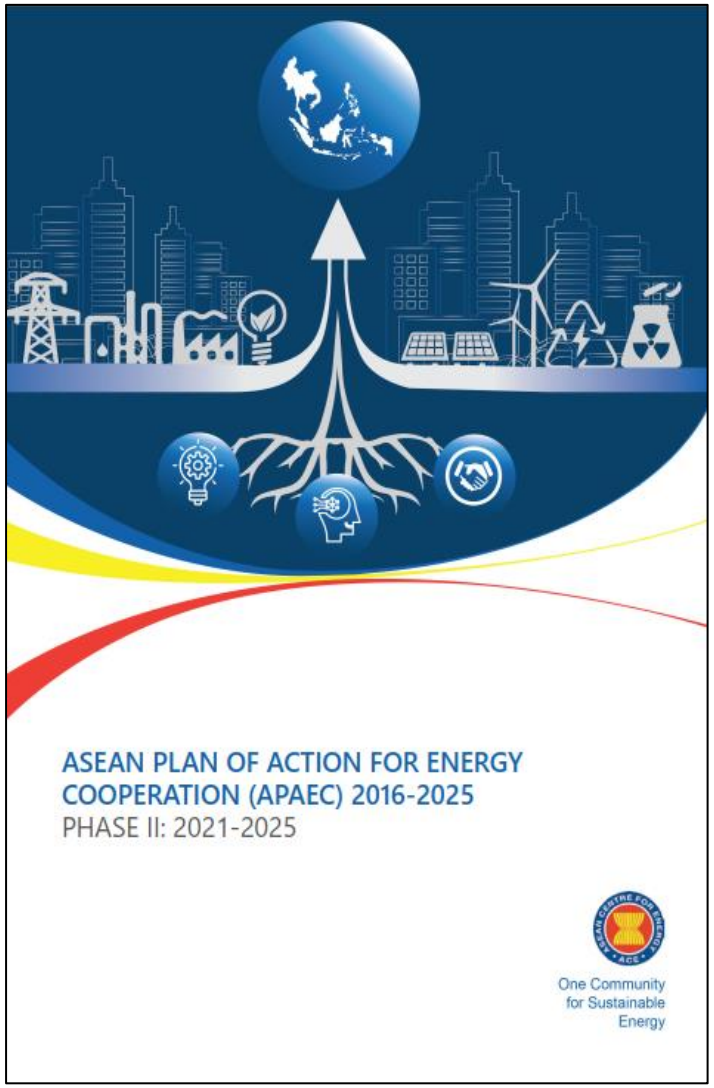
AEDS ASEAN Energy Database System

THE 6TH ASEAN ENERGY OUTLOOK 2017-2040

Implementing Agency of Regional Blueprint

ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025

APAEC 2016-2025 Phase II: 2021-2025



Enhancing Energy Connectivity and Market Integration in ASEAN to Achieve Energy Security, Accessibility, Affordability and Sustainability for All

Accelerating Energy Transition and Strengthening Energy Resilience Through Greater Innovation and Cooperation

1. ASEAN Power Grid
To expand regional multilateral electricity trading, strengthen grid resilience and modernisation, and promote clean and renewable energy integration.

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. Coal and 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

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

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**.

ASEAN Energy Outlook (AEO) on APAEC

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"

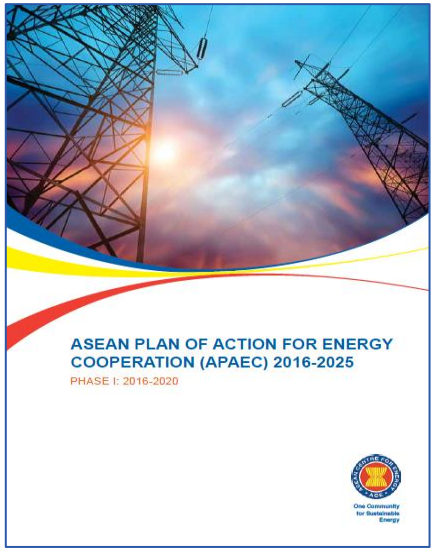
Sub-Theme: "Accelerating Energy Transition and Strengthening Energy Resilience through Greater Innovation and Cooperation".

RENEWABLE ENERGY TARGET

Increase **RE share** to **23%** in **TPES** and **35%** in ASEAN **installed power capacity** by 2025

EI REDUCTION TARGET

Reduce **EI** by **20% in 2020, 32% in 2025** based on 2005 level.



- ASEAN Power Grid
- Trans-ASEAN Gas Pipeline
- Coal and Clean Coal Technology
- Energy Efficiency and Conservation
- Renewable Energy
- **Regional Energy Policy and Planning**
- Civilian Nuclear Energy

ASEAN Energy Outlook (AEO) **complements the APAEC** and **supports the creation of pathways** for achieving the **regional targets.** Guided by **Programme Area No. 6: Regional Energy Policy and Planning**; **Action Plan 1.2**: Publish regular regional energy outlooks and strategic reports on the thematic issue.

The Principles of AEO

ASEAN Energy Outlook (AEO) **complements the ASEAN Plan of Action for Energy Cooperation (APAEC)** and **supports the creation of pathways** for achieving the **regional targets.** Guided by **Programme Area No. 6: Regional Energy Policy and Planning**; **Action Plan 1.2**: Publish regular regional energy outlooks and strategic reports on the thematic issue.

COLLABORATION	HARMONISATION	VALIDATION
Consultation with experts from all 10 AMS through individual country visits for data collection, scenario discussion, and regional targets	Each AMS model is done individually in one regional environment, making it possible to standardise the data for all AMS while still able to analyse individual country	Close and constant coordination with the assigned Focal Points for data collection & target interpretation

AEO aims to be the voice of ASEAN for the energy sector, as it incorporates major involvement from all 10 AMS in every process

AEO Throughout the Years

1 AEO 1 to AEO3 (2006 – 2012*)

Almost fully developed by IEEJ (Japan), with ACE as the facilitator.

2 AEO 4 (2014 – 2015)

- Presented at 33rd AMEM: Minister-CEO Dialogue in KL, Malaysia, September 2015.
- **80% work by External Consultant**, ACE supported on data collection process.

3 AEO5 (2015 – 2017)

- Launched at 35th AMEM in Manila, the Philippines, September 2017
- **ACE worked 40%** not only on data collection but also on modelling work.

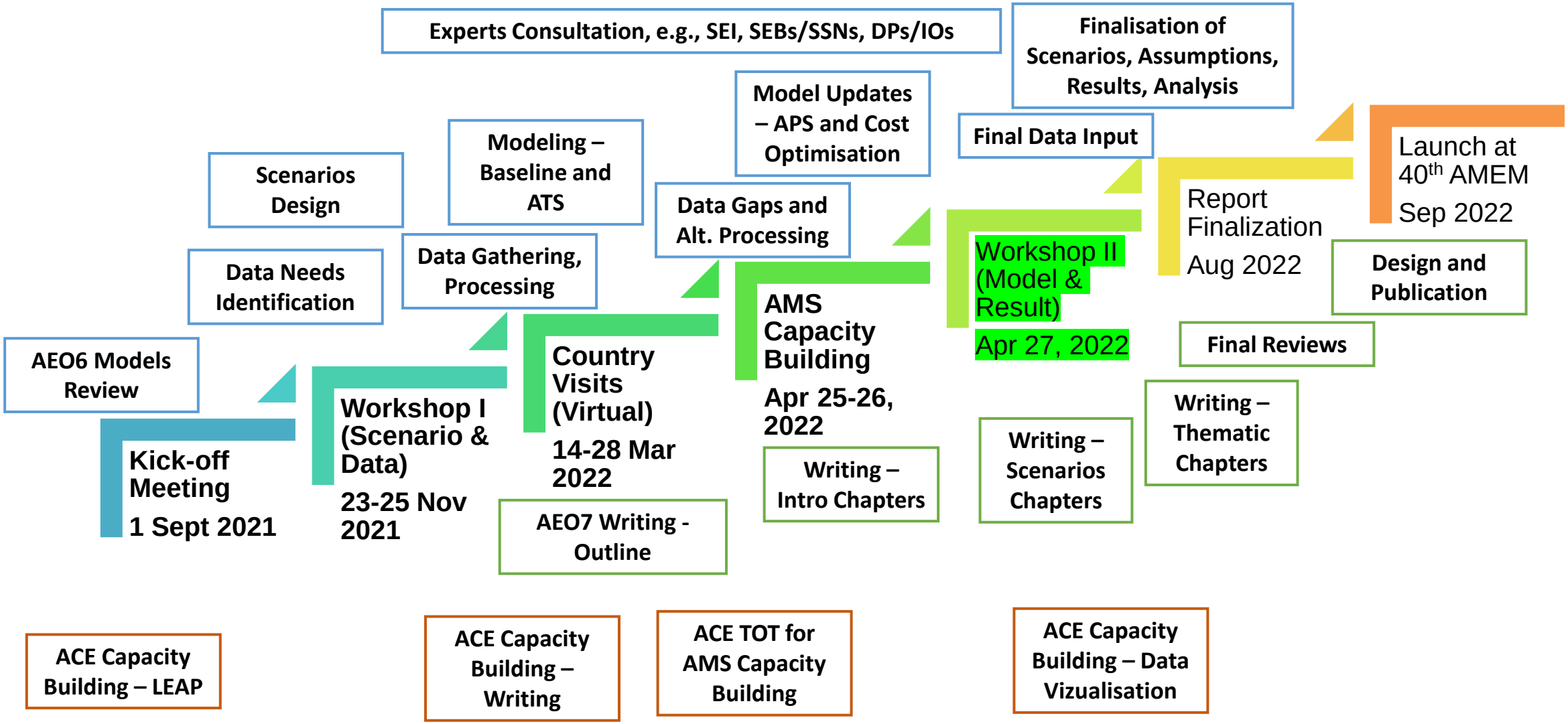
4 AEO6 (2018 – 2020)

- Launched at 38th AMEM in Vietnam, November 2020.
- **ACE do about 70%** of the modelling work, engaging the External Consultant mostly on the analytics part.

5 AEO7 (2020 – 2021)

- Launched at 40th AMEM, 2021.
- **ACE do up to 100%** of the modelling work, engaging the External Consultant mostly as advisory role.

AEO7 Milestones towards the 40th AMEM in Cambodia



The 7th ASEAN Energy Outlook (AEO7)

Launched in 40th ASEAN Ministers on Energy Meeting in Cambodia

Supported by: german cooperation DEUTSCHE ZUSAMMENARBEIT; Implemented by giz; METI Ministry of Economy, Trade and Industry; ACCEPT

Technical Support: SEI; CASE for Southeast Asia

Introduction

Establishes contextual setting of the ASEAN energy landscape, challenges, efforts, ambitions, and the role of regional cooperation and outlook in addressing energy dynamics within the region

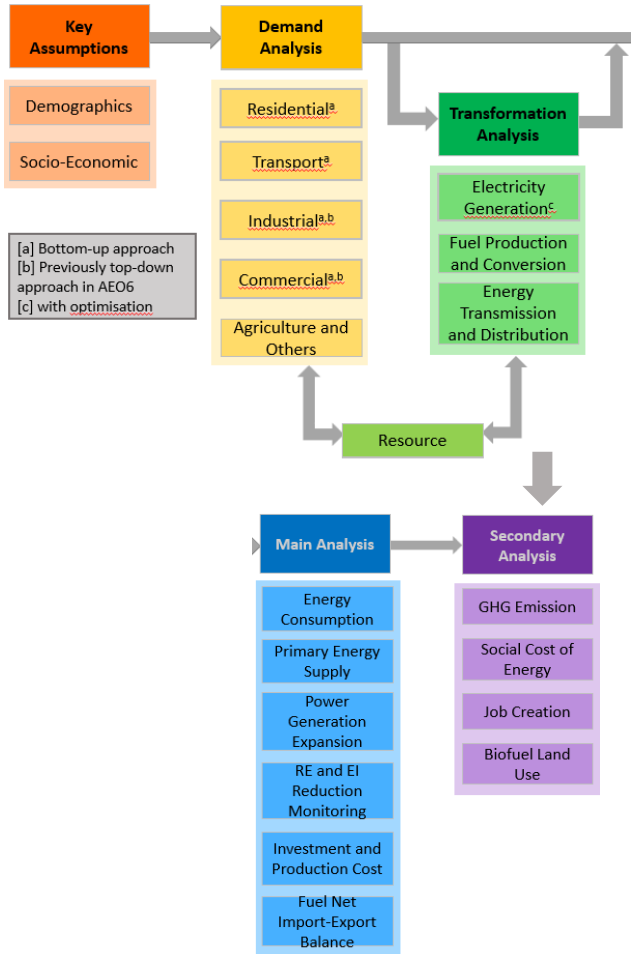
The population and economic growth activities linked to global energy dynamics and implications for the energy sector

The elements of energy security, accessibility, affordability, inclusivity, and sustainability challenges for ASEAN

The role of energy cooperation under the ASEAN Plan of Action for Energy Cooperation (APAEC) and AEO7 supports in creation of pathways to address the challenges

Methodology

Provides the reasoning behind the AEO7 modelling arrangement

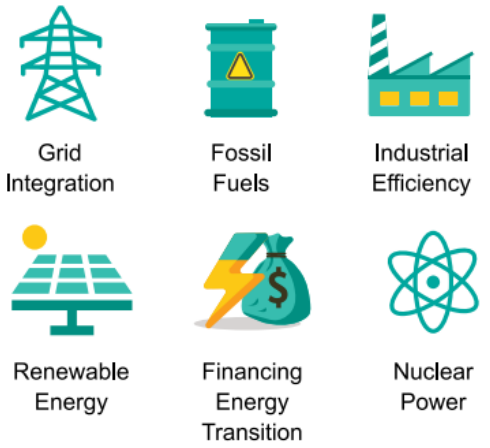


Exploring Multiple Futures

Explains the analysis of the modelling results based on the AEO7 scenarios and the implications for energy demand and supply, emissions, and socio-economic impacts in the ASEAN region, including social cost of energy, renewable job creation, and land use of biofuel

Assessing Measures for Energy Resilience

Elaborates on six emphasised energy sectors considered essential to attaining secure and reliable energy amidst transition



Recommendations and Improvements

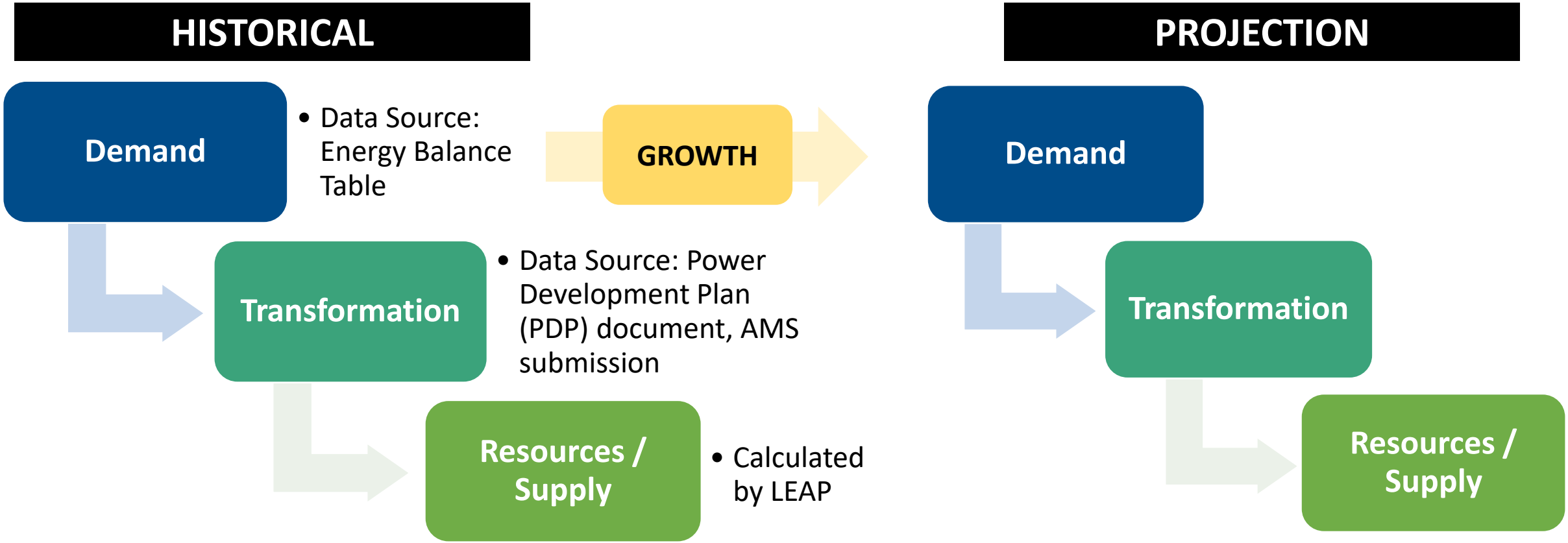
Offers key energy policy proposals and strategic steps to address barriers in utilising resources to meet the demand of the ASEAN Member States from end-use and power sectors, and aligning them with the regional targets, in conjunction with institutional, data, and model improvement prospects for the subsequent editions of the ASEAN Energy Outlook

ASEAN CENTRE FOR ENERGY · ACE ·

The Modeling of AEO

AEO mainly uses Low Emissions Analysis Platform (LEAP) software, a scenario-based demand-driven modeling tool that can be used to track energy consumption, production and resource extraction in all sectors of an economy

Simplified version of energy balance and projection calculation



Requirement of Data

Energy Demand and Its Technologies

- Residential: Appliances Stocks
- Commercial: Floor Area
- Industry: Disaggregated
- Transport: No of Vehicles, Load Factor, Fuel Economy
- Agriculture and Others
- Non-Energy

Energy Access

- Access to clean cooking (% of population)
- Electrification Rate (%)

Energy Supply (with Optimisation*)

- Exogenous Capacity Data
- Historical Production Data
- Electricity Generation Data – General
  - Reserve Margin*
  - Losses & Own Use
- Electricity Generation Data – Process
  - Capacity Credit
  - Max. Availability
  - Salvage Value*
  - Fixed OM Cost & Variable OM Cost*
  - Capital Cost*
  - Process Efficiency
  - Minimum & Maximum Capacity*
- Resource Data – Primary
  - Import Cost*
  - Indigenous Cost*
  - Resource Exports & Import
  - Base Year Reserves *
  - Additions to Reserve*
  - Yield*

Socio Economic

- Population – Household
- Gross Domestic Product (GDP)
- Employment Rate
- Average Income

Others

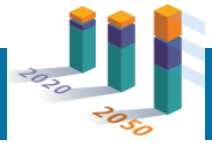
- Emission
- Energy related job creation
- Investment Cost
- Social Cost
- Technology availability

Policy

- Power Development Plan (PDP)
- Policy on RE Target
- Policy on EE/EI Target
- NDC for Energy Sector

AEO7 Scenario Overview

Historical data from 2005 – 2020 are projected out to 2021 – 2050 in four scenarios



Scenario	**Baseline Scenario** The energy growth pattern kept at a constant level as of the last historical year.	**AMS Targets Scenario (ATS)** Achievement of ASEAN official national energy targets.	**APAEC Targets Scenario (APS)** Achievement of APAEC'S aspirational regional targets on RE and EI.	**Least-Cost Optimisation (LCO)** Least-cost power sector dispatch to attain APAEC's regional targets.
Energy Efficiency	Kept constant at the level for last historical year	Based on individual Member States' targets	Raise individual Member States' targets to meet the regional target	Same deployments of EE&C strategies with APS to meet the regional target.
Renewable Energy	Growth rate kept based on the last historical year	Based on individual Member States' targets	Raise individual Member States' targets to meet the regional target	The power system was optimised to determine the least-cost dispatch that allows attainment of national and regional RE targets
Installed Power Capacity	No installed capacities from national Power Development Plan (PDP)	Consistent with PDP, prioritising renewable energy when adding new capacity	Included PDP at minimum but accelerated deployment of RE capacity based on each country's potential	The PDP capacity additions are included but model is allowed to build additional plants, and select the dispatch that constitutes the least-cost

Increase ambitions of RE and EE/EI standards

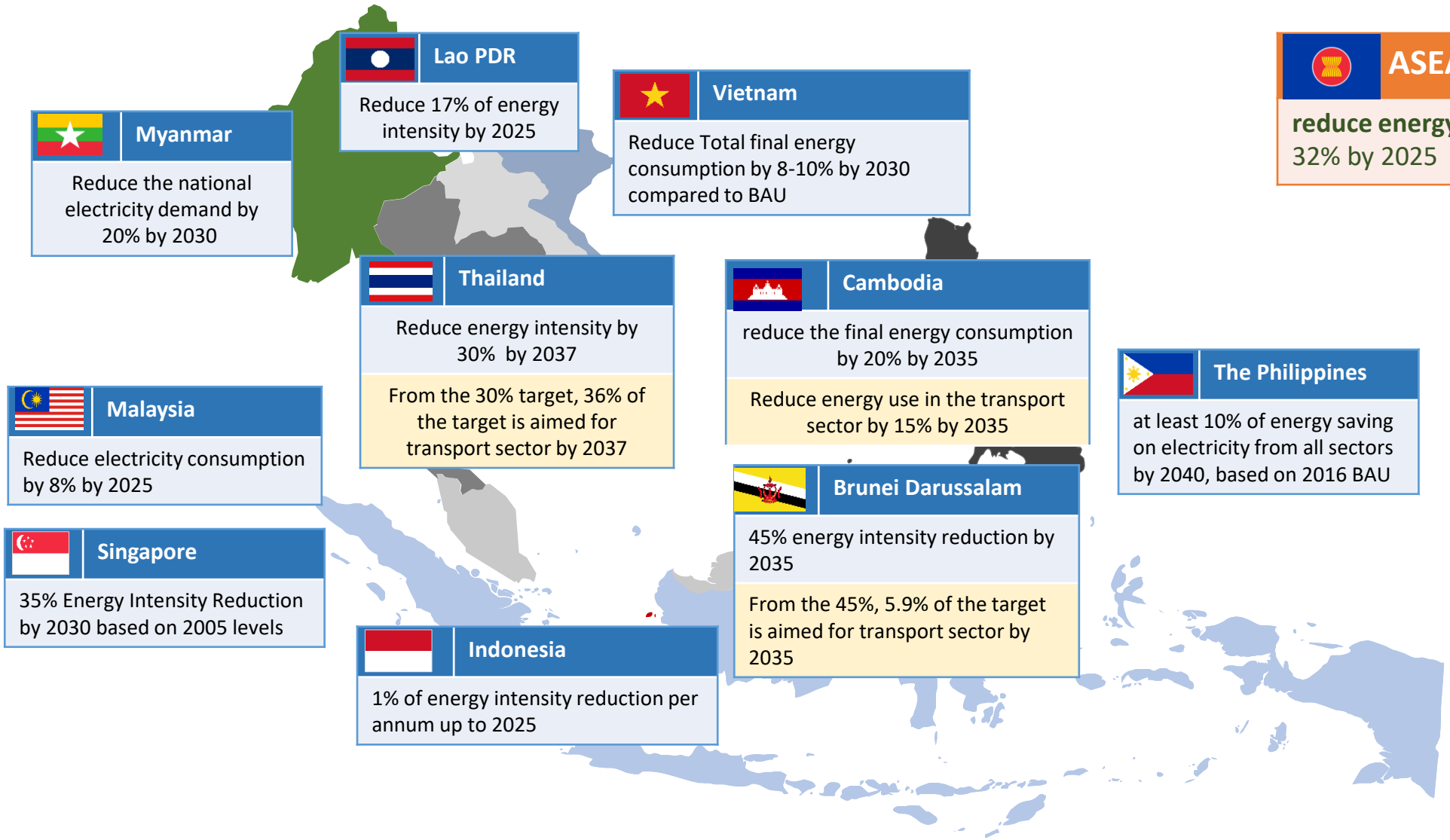
Least-cost option in power sector

AMS National RE targets

Country	Official Target on Renewable Energy
Brunei Darussalam	Achieve a 30% share of RE in the power generation mix by 2035
Cambodia	25% increase in renewable energy in the power mix (generation capacity) by 2030 (solar, wind, hydro, biomass)
Indonesia	🕐 Increase RE share to 23% in primary energy supply by 2025 and 31% by 2050 🕐 Biodiesel blending ratio target 30% by 2025; Bioethanol blending ratio 20% by 2025 and 50% by 2050 🕐 Achieve a 19.6% share of RE in electricity production in 2030
Lao PDR	🕐 30% share of RE in total energy consumption by 2025, including 20% renewable electricity share (excluding large-scale hydro) and 10% biofuel share (blending ratio 5%-10%) 🕐 13 GW total hydropower capacity (domestic and export use) in the country by 2030
Malaysia	Increase the RE share to 31% in the power capacity mix by 2025 and 40% by 2035
Myanmar	Increase the share of RE to 39% in electricity generation by 2030 (28% hydro or 5156 MW, and 11% other RE or 2000 MW)
Philippines	🕐 Increase the RE share to 35% in the power generation mix by 2030 and 50% share by 2040 🕐 Implement 5% blending for biodiesel starting in 2022
Singapore	Increase solar energy deployment to at least 1.5 GWp by 2025 and 2 GWp in 2030
Thailand	Increase the RE share to 30% in TFEC by 2037, including 15%–20% renewable electricity in a total generation; 30%–35% of consumed heat from renewables; and a 20%–25% biofuel share in TFEC
Vietnam	🕐 Increase the RE share in TFEC to 32.3% by 2030 and 44% by 2050 🕐 Increase the RE share in power generation to 32% by 2030 and 43% by 2050

Source: Multiple official documents

AMS National EE&C Targets



Lao PDR

Reduce 17% of energy intensity by 2025

Myanmar

Reduce the national electricity demand by 20% by 2030

Vietnam

Reduce Total final energy consumption by 8-10% by 2030 compared to BAU

ASEAN

reduce energy intensity by 32% by 2025

Thailand

Reduce energy intensity by 30% by 2037

From the 30% target, 36% of the target is aimed for transport sector by 2037

Cambodia

reduce the final energy consumption by 20% by 2035

Reduce energy use in the transport sector by 15% by 2035

The Philippines

at least 10% of energy saving on electricity from all sectors by 2040, based on 2016 BAU

Malaysia

Reduce electricity consumption by 8% by 2025

Brunei Darussalam

45% energy intensity reduction by 2035

From the 45%, 5.9% of the target is aimed for transport sector by 2035

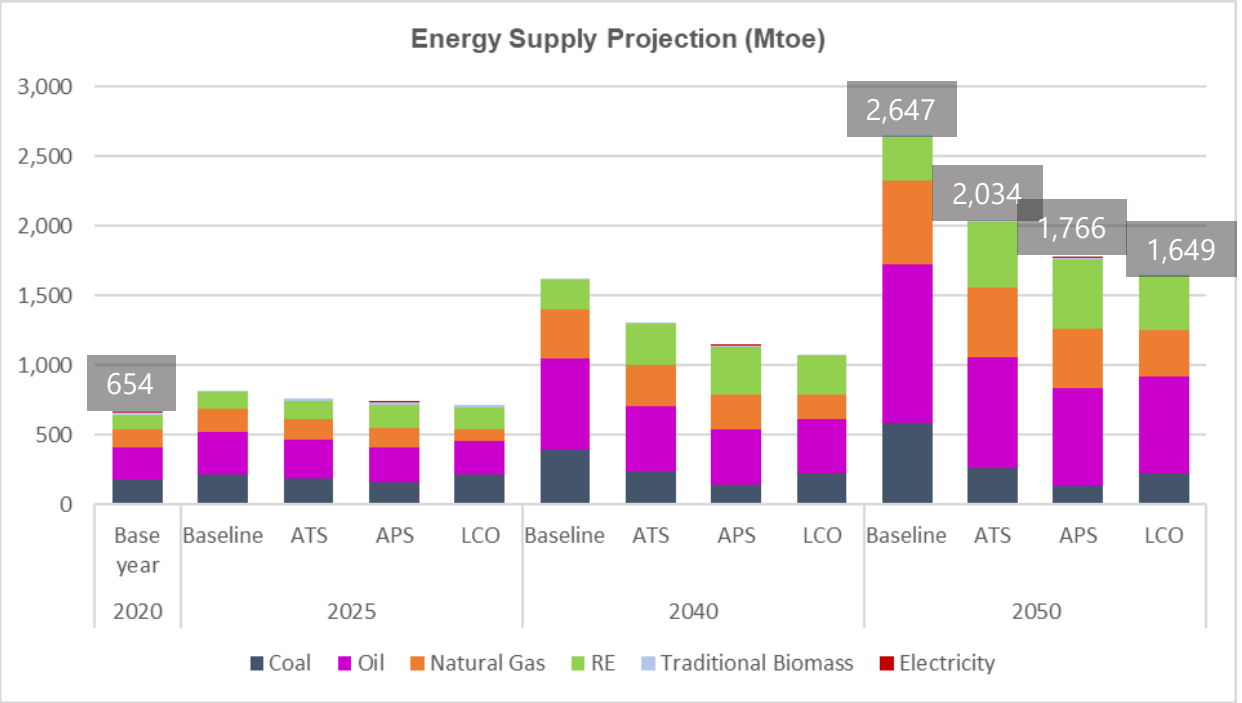
Singapore

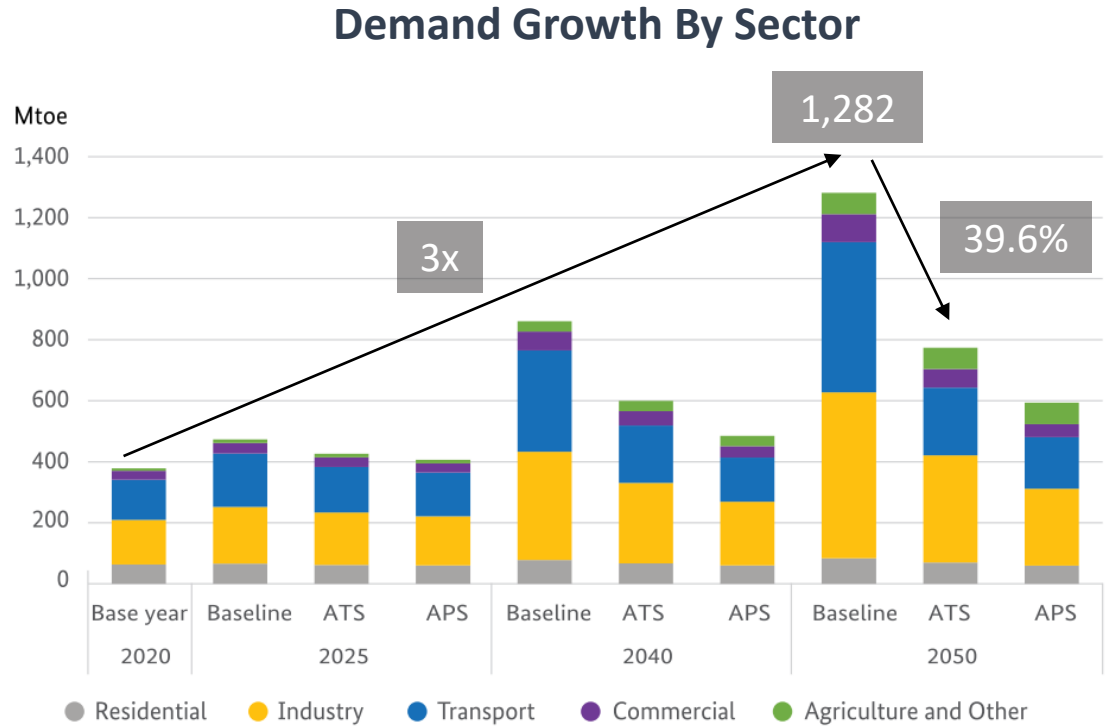
35% Energy Intensity Reduction by 2030 based on 2005 levels

Indonesia

1% of energy intensity reduction per annum up to 2025

Key Analyses: Pathways of ASEAN energy system



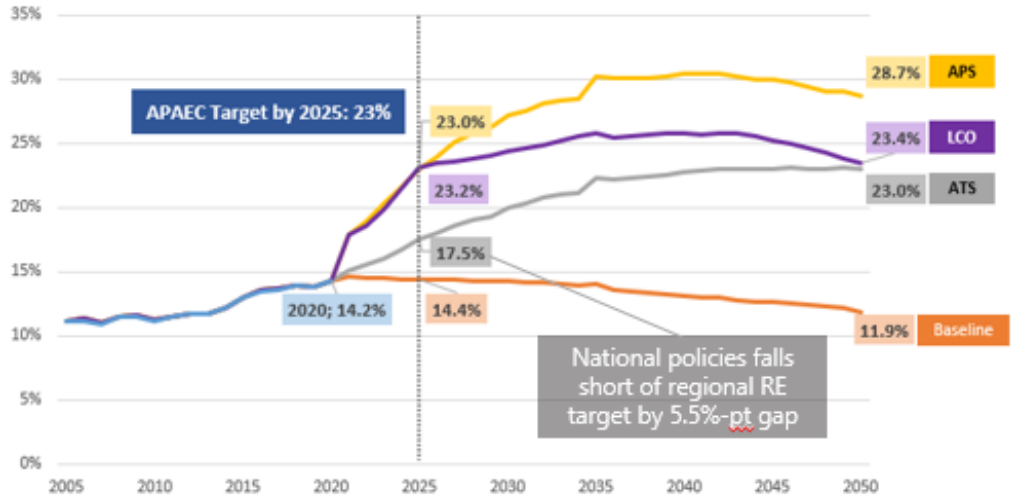


- Baseline Scenario projected a 4x of energy required to fuel the economic growth from 2020 to 2050. Energy efficiency measures reduce the need of energy to 3x and 2.7x in ATS and APS.
- LCO Scenario reduces the demand further to 2.5x of 2020.
- In all scenarios, fossil fuels remain the largest component.

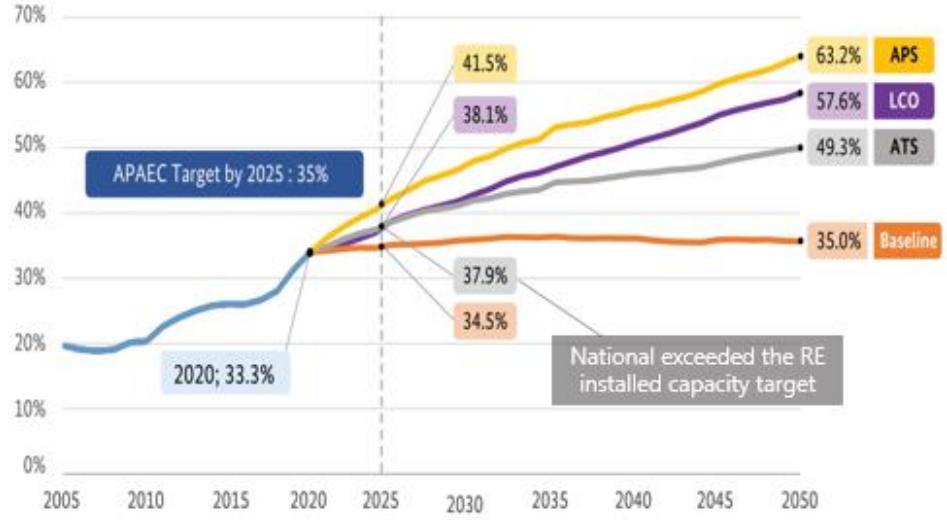
Industry and transport sectors continue to be the highest energy consuming sectors in the region

Key Analyses: Monitoring and Projection of Targets

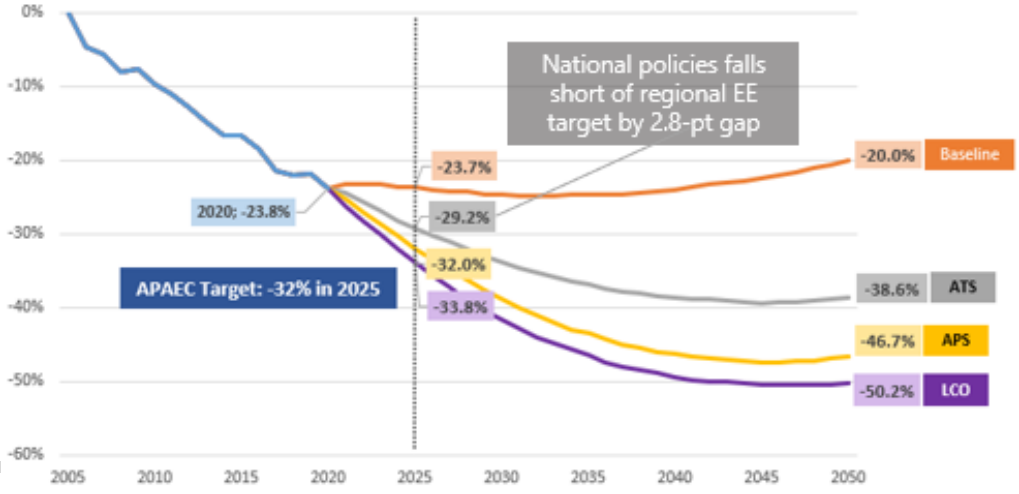
Renewable Share in Total Primary Energy Supply



Renewable Share in Installed Power Capacity



Energy Intensity Reduction from 2005 Level



2025	Renewable Share in Total Primary Energy Supply	Renewable Share in Intalled Power Capacity	Energy Intensity Reduction based on 2005 level
APAEC Target	23%	35%	32%

Baseline Scenario
The energy growth pattern kept at constant level as of last historical year

AMS Targets Scenario (ATS)
Achievement of ASEAN official national energy targets

APAEC Targets Scenario (APS)
Achievement of APAEC's aspirational regional targets on RE and EI

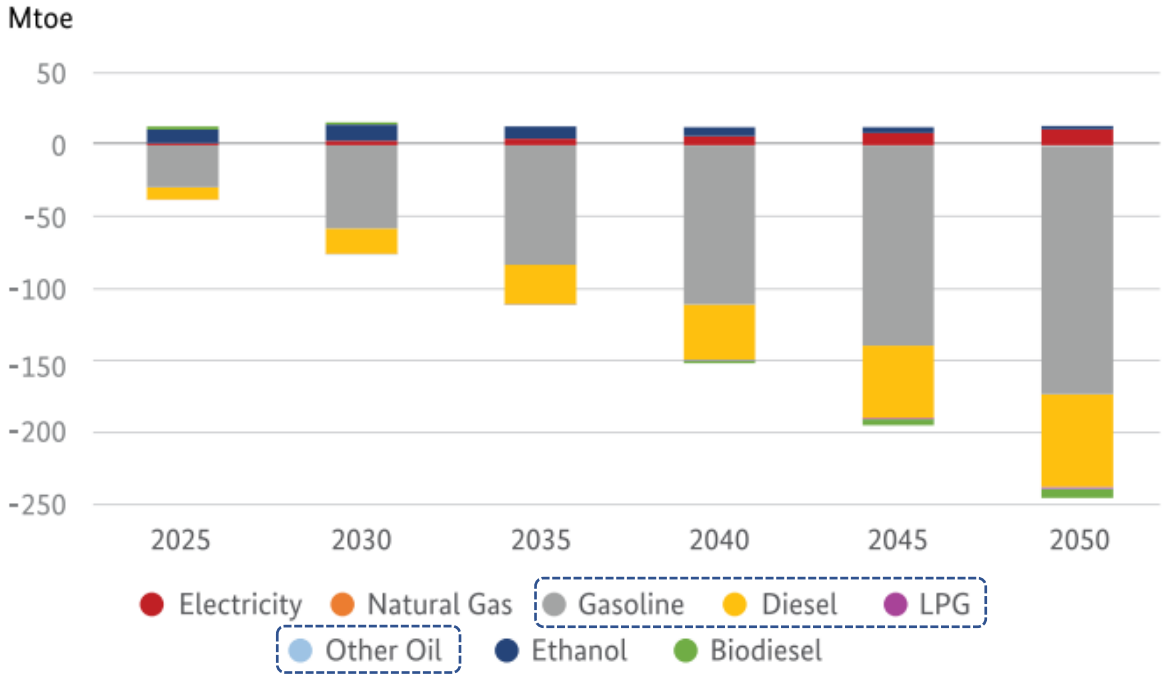
Least-Cost Optimisation (LCO)
Least-cost power sector dispatch to attain APAEC's regional targets

Increase ambitions of RE and EE/EI standards → Least-cost option in power sector

Source: The 7th ASEAN Energy Outlook, 2022
http://go.aseanenergy.org/AEO7

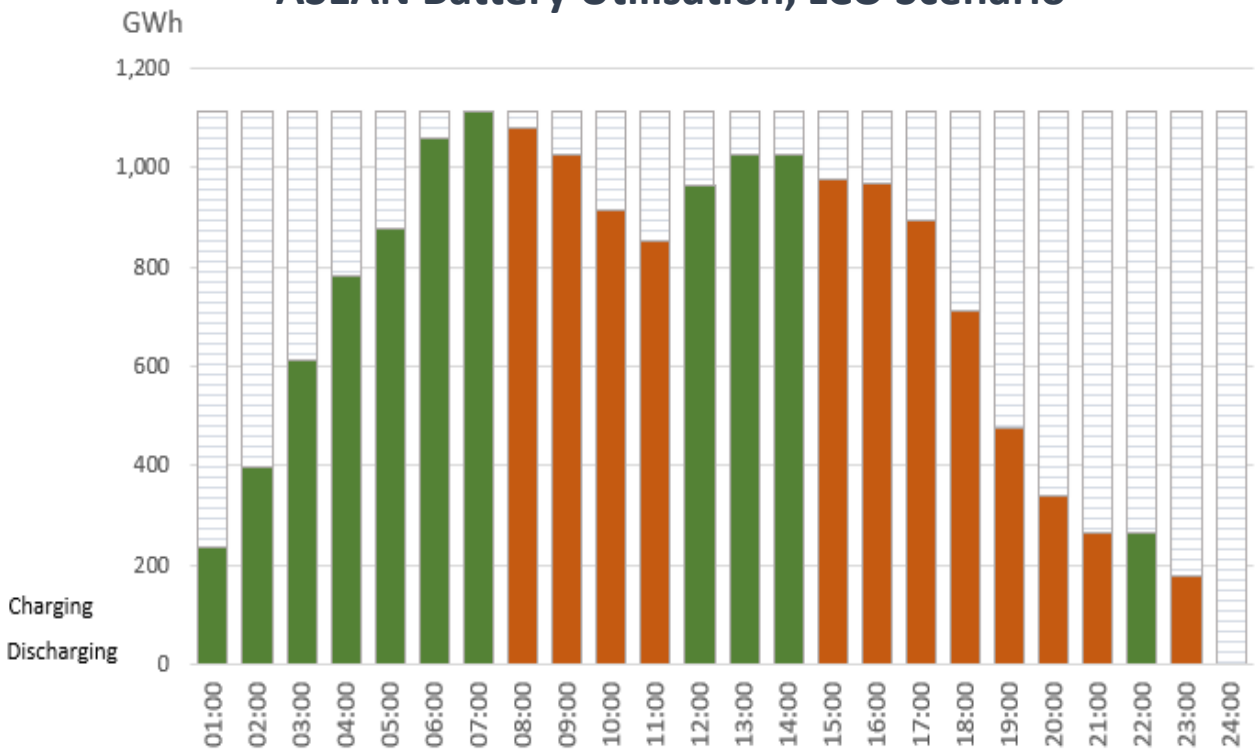
Key Analyses: Technologies and Policies

Fuel shifting in Road Transport, APS vs Baseline



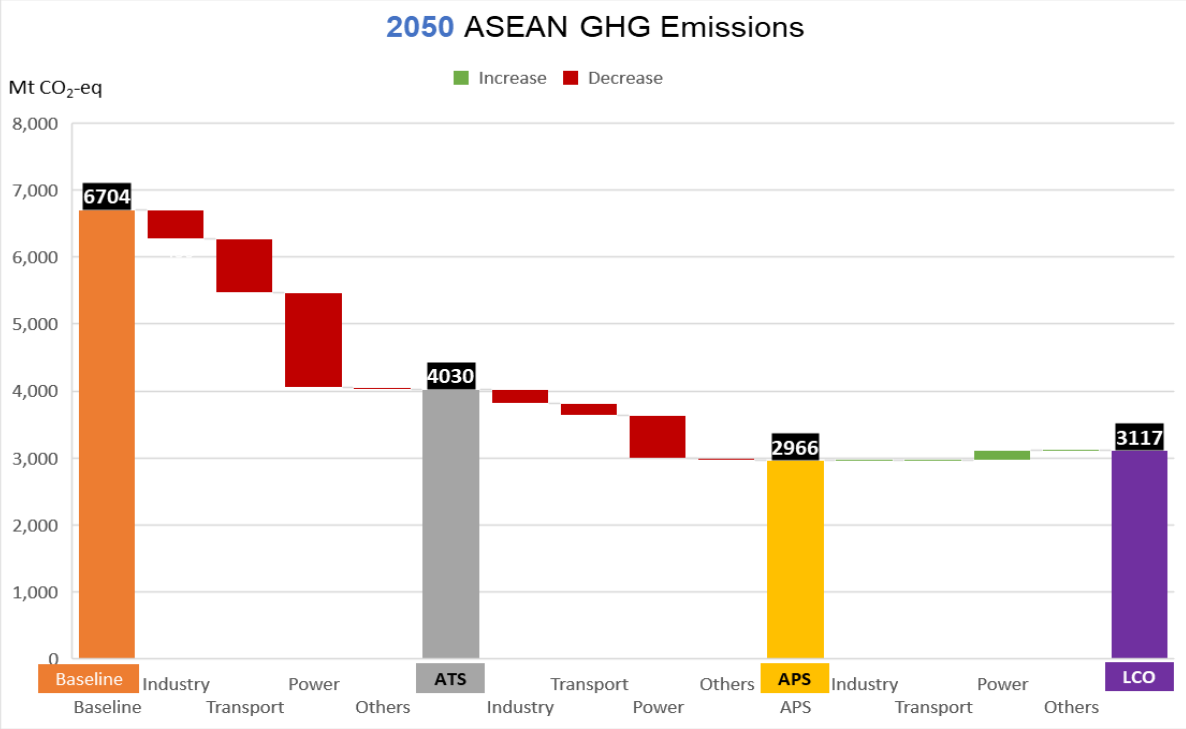
- **Oil products** remain the largest fuel in the transport sector, about 91% of the energy consumption of the vehicle fleet in 2050 under the Baseline Scenario.
- In the APS, deploying more efficient electric and hybrid vehicles **reduces gasoline and diesel usage** by about 72% and 59%, respectively.

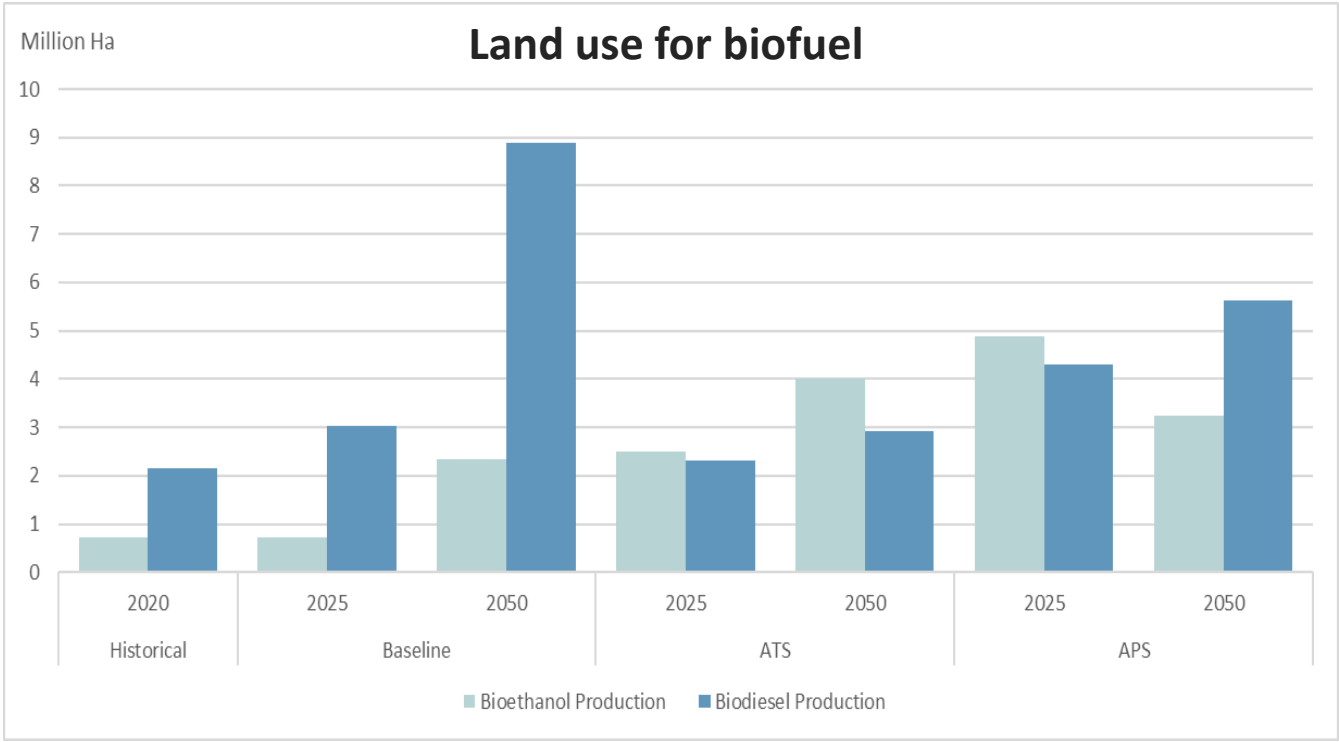
ASEAN Battery Utilisation, LCO Scenario



- Batteries can be used to provide stored power during peak hours. Crucial in enabling higher penetration of RE and maintaining the power grid's stability.
- In the LCO Scenario, the region is expected to require 26.6 GW of capacity to store about 1,100 GWh of electricity by 2050.

Secondary Analyses: Emissions, Land Use, etc.





In 2050, the annual GHG emissions from energy system would reach 6.7 Gt $CO_{2\text{-eq}}$ in Baseline Scenario

In 2050 Baseline Scenario, 8.8 million Ha of land is required to produce biodiesel (oil palm) and 2.3 million Ha for bioethanol (sugarcane), or about 2.5% of the AMS land mass

ASEAN Centre for Energy
One Community for Sustainable Energy

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aseanenergy.org/category/publications/

For further information or to provide feedback, please contact ACE at **secretariat@aseanenergy.org**

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Thank You

Potential for green job creation

Added Installed Capacities from 2020 level

2025 **41 GW** (ATS) | **51 GW** (APS)

2050 **255 GW** (ATS) | **311 GW** (APS)

Total RE Job Creation

2025

- ATS **857 Thousand**
- APS **1 Million**
- LCO **960 Thousand**

2050

- ATS **4.5 Million**
- APS **5.5 Million**
- LCO **3.2 Million**

Job addition dominated by Vietnam and Indonesia

	ATS	APS	LCO
VN	29%	31%	22%
ID	27%	27%	21%
Others	44%	42%	42%

(2050)

Hydro makes up the most RE jobs, followed by Solar

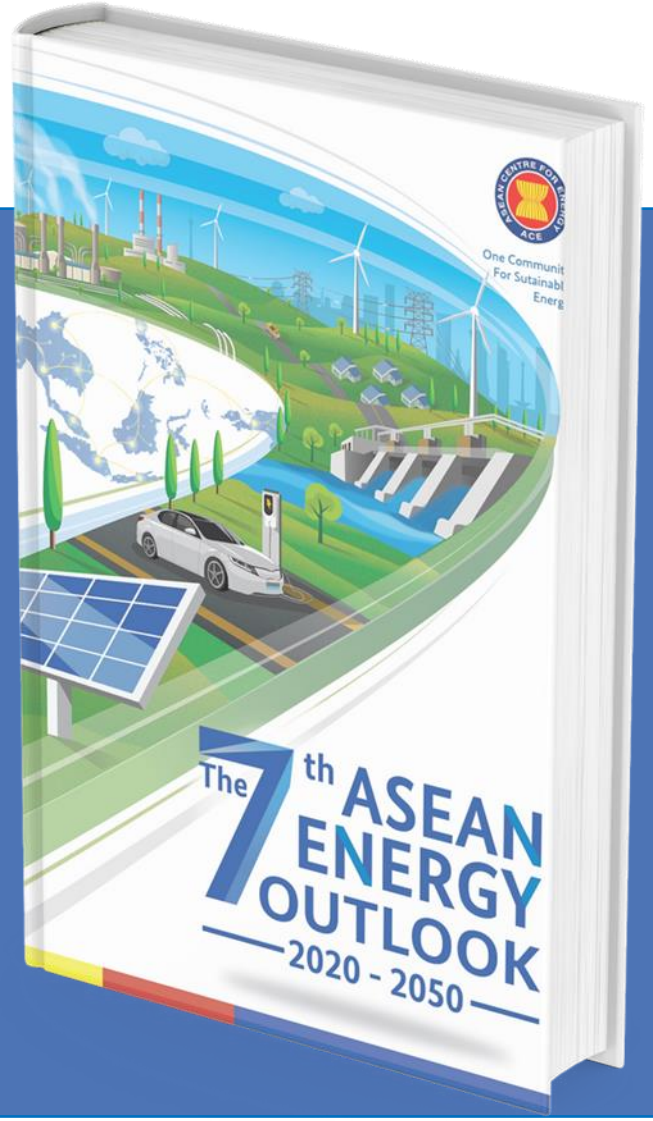
	ATS	APS	LCO
Hydro	3 Million	3.7 Million	2.5 Million
Solar	851 Thousand	1 Million	526 Thousand

(2050)

- Strong renewable deployment in the regional policies scenario (APS) is **projected to provide up to 5.5 million new jobs** in the construction, installation, operation and maintenance by 2050. About 67% of these would be involved in the hydropower plants, followed by 19% solar.

AEO7 Dissemination Seminar – Universiti Tenaga Nasional (UNITEN)

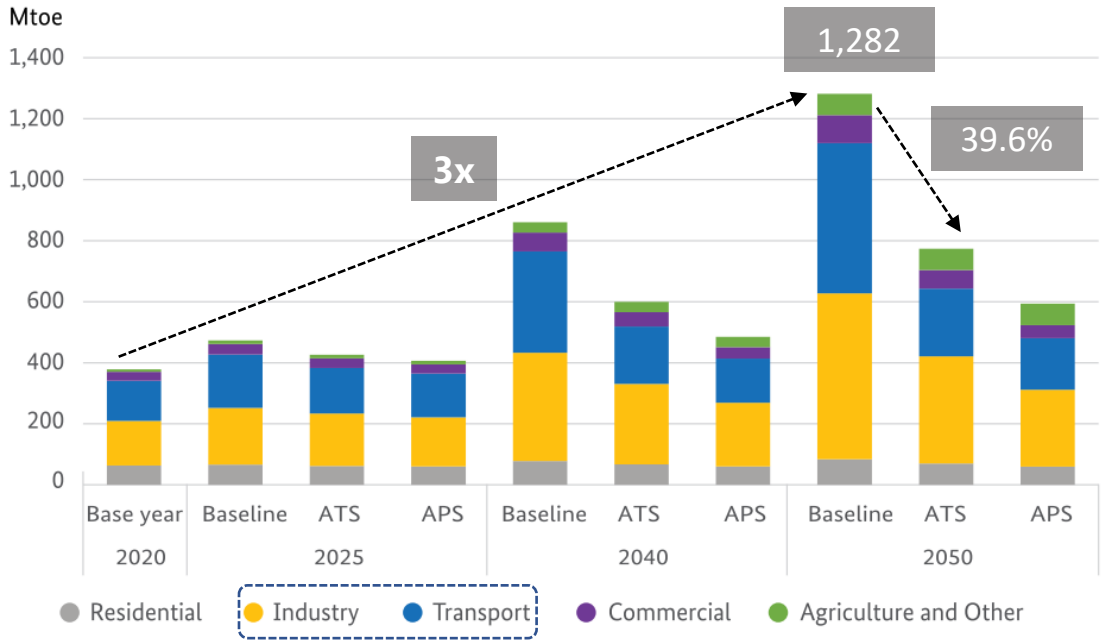
The 7th ASEAN Energy Outlook: Findings and Recommendation



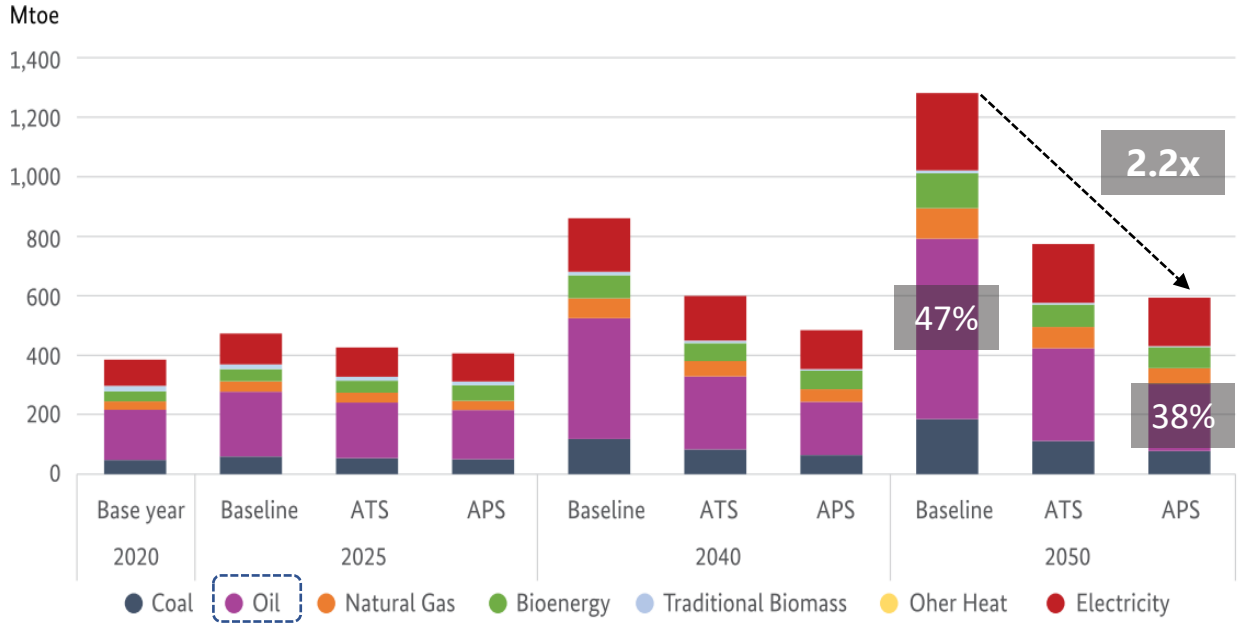
Presented by:
Rika Safrina
on behalf of the 7th ASEAN Energy Outlook (AEO7) Team

ASEAN energy demand

By Sector



By Fuel

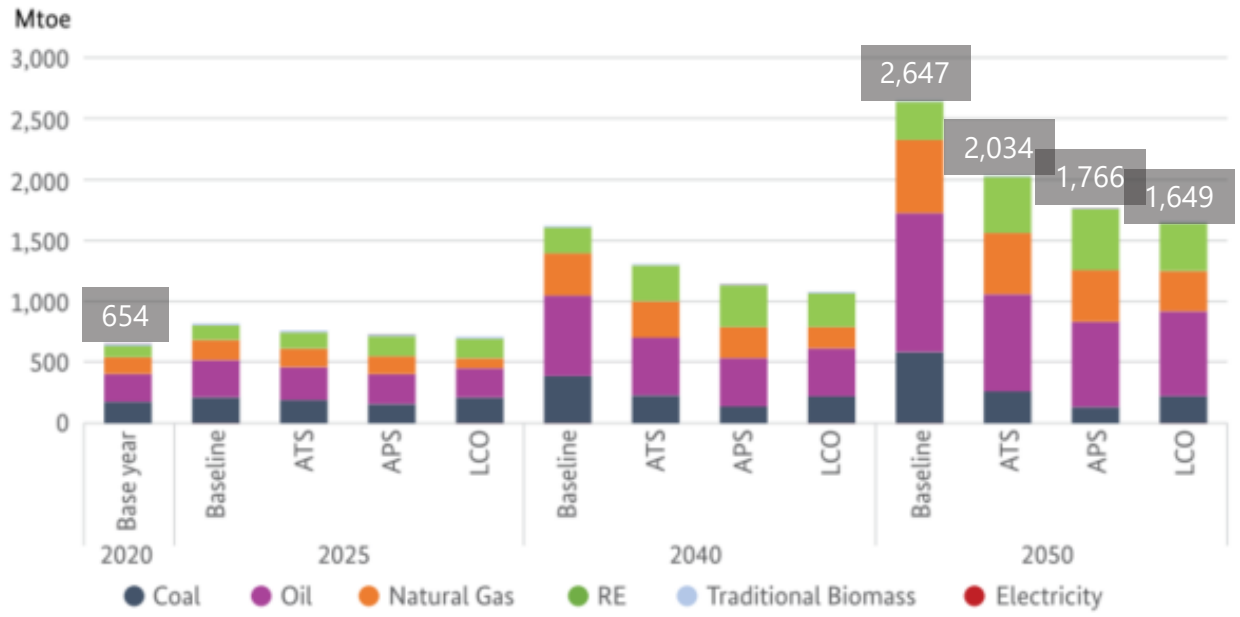


- **Industry and transport sectors** remain the largest energy-consuming sectors in the region.
- Compared to the Baseline Scenario, the avoided energy consumption will be the greatest under ATS. This is expected due to various EE&C policies looking to be set by the AMS.

- In line with rapid economic growth, regional **energy demand is expected to triple** that of 2020 levels by 2050.
- Oil products continue to be the highest consumed, with 47% share in the 2050 Baseline Scenario, and reduced to 38% in APS for the same year.

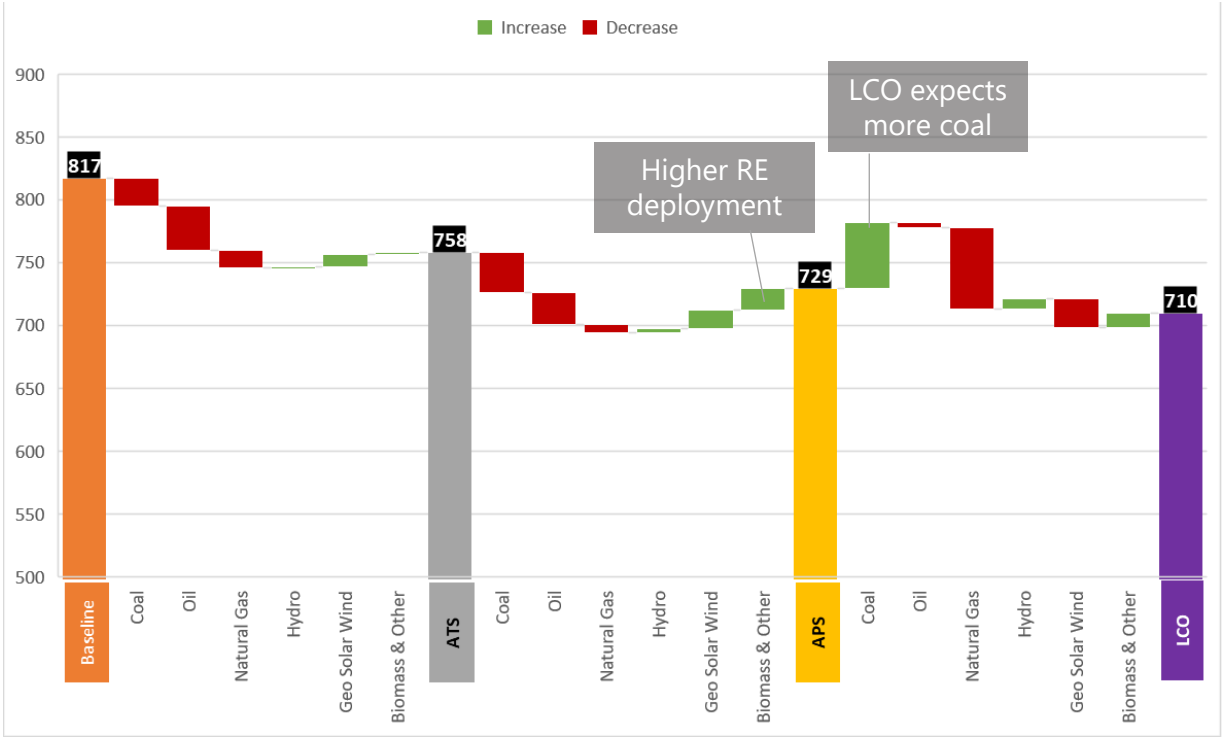
Changes in various pathways of ASEAN energy supply

Energy Supply Projection by Fuel Across Scenarios



- Baseline Scenario projected a 4x of energy produced to drive economic growth from 2020 to 2050. Energy efficiency measures reduce the energy supply to 3x and 2.7x in ATS and APS.
- LCO Scenario reduces the supply further to 2.5x of 2020.
- In all scenarios, **fossil fuels remain the largest component**.

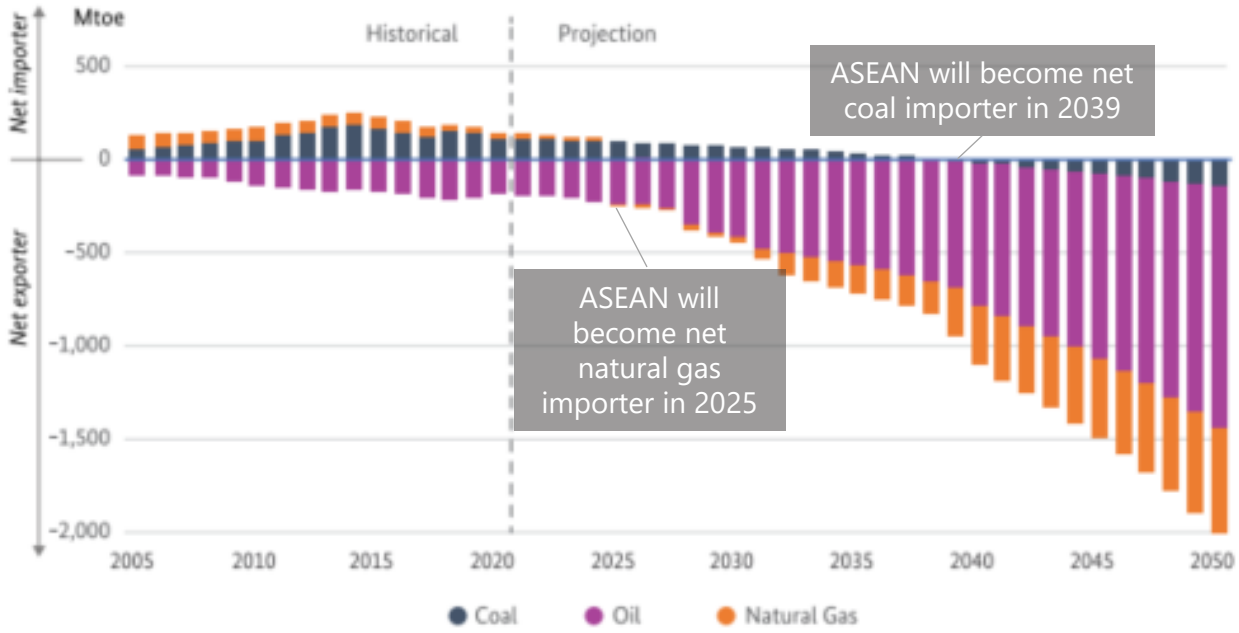
ASEAN TPES Fuel Shifting in 2025 (Mtoe)



- To reach APAEC targets in 2025, **energy efficiency measures need to be coupled with increasing share of RE**.
- LCO Scenario further reduces the TPES, shifting the system away from natural gas and solar-wind, replaced by coal and bioenergy.

Addressing energy security – import dependency

Net Import, Baseline Scenario



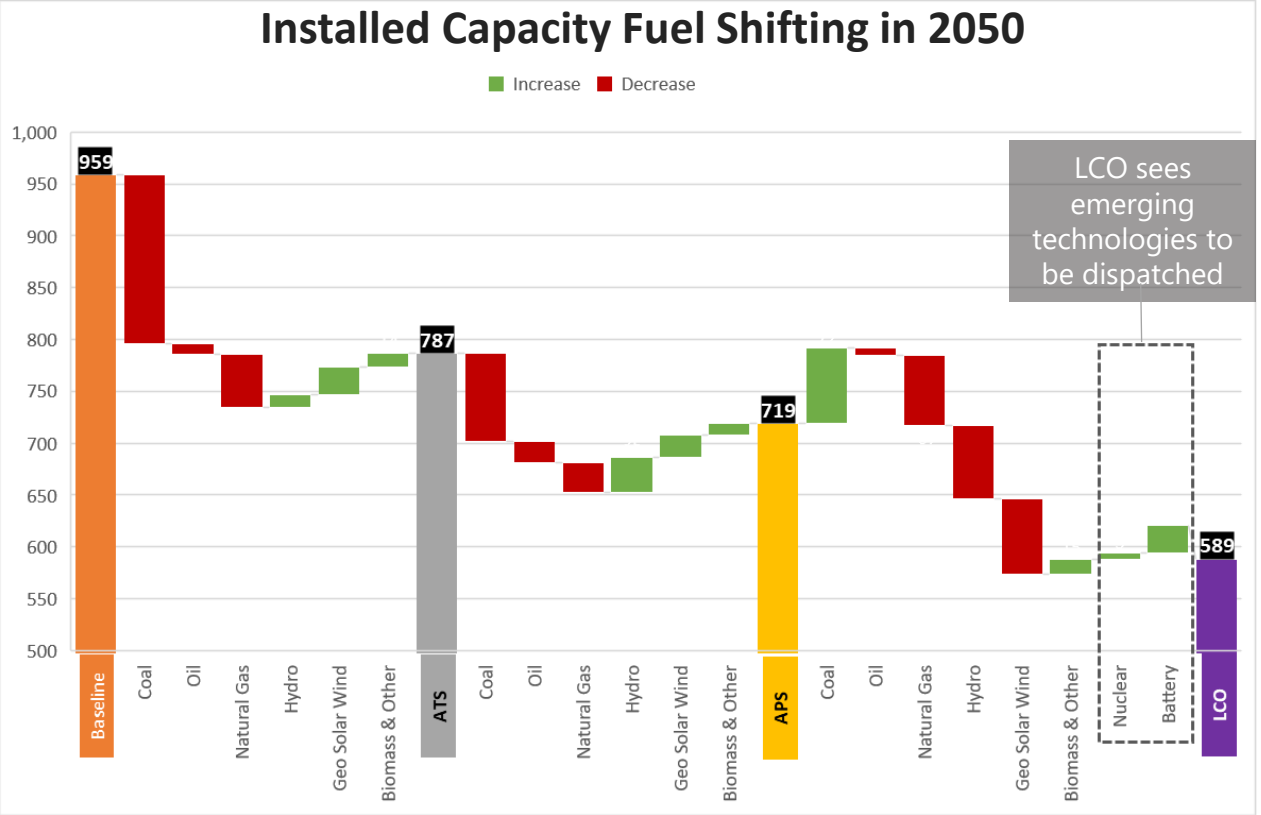
Net Importer Status of ASEAN

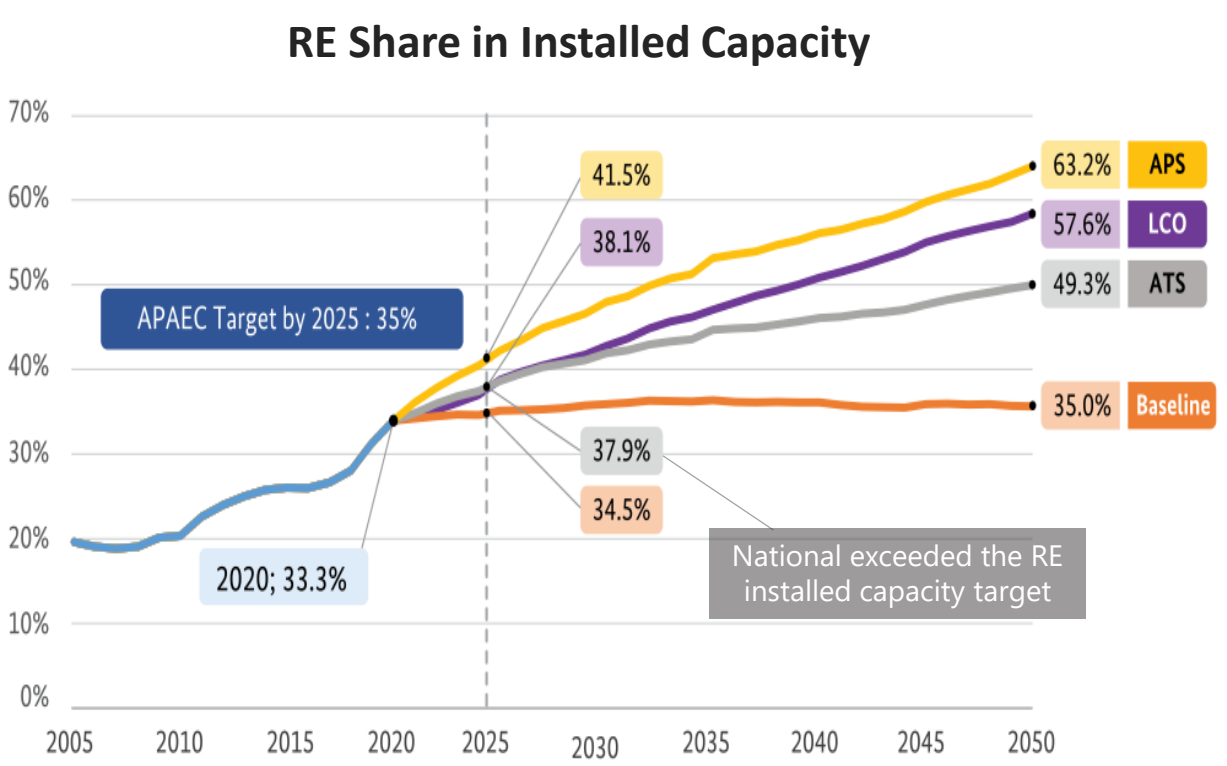
		Oil	Gas	Coal
Baseline	Start Year	Pre-2005	2025	2039
	2050 (Mtoe)	-1,289	-577	-143
ATS	Start Year	Pre-2005	2025	Post-2050
	2050 (Mtoe)	-947	-479	53
APS	Start Year	Pre-2005	2026	Post-2050
	2050 (Mtoe)	-847	-402	138
LCO	Start Year	Pre-2005	2035	Post-2050
	2050 (Mtoe)	-846	-309	79

- In Baseline Scenario, without significant discoveries and/or additions to existing production infrastructures, and with continuous utilisation of fossil fuels, ASEAN would become **a net importer of natural gas and coal** starting from 2025 and 2039, respectively.
- Previously, AEO6 projected the years to be 2024 and 2035.

- With the increasing share of RE in the energy mix and implementation of EE&C measures, ASEAN would remain a net exporter of coal during the projection period.
- Natural gas net import starts similarly, in 2025 and 2026, respectively. Meanwhile, **oil net import can be reduced by 26% (ATS) and 34% (APS)** compared to the Baseline in 2050.

The evolving electricity generation system – capacity



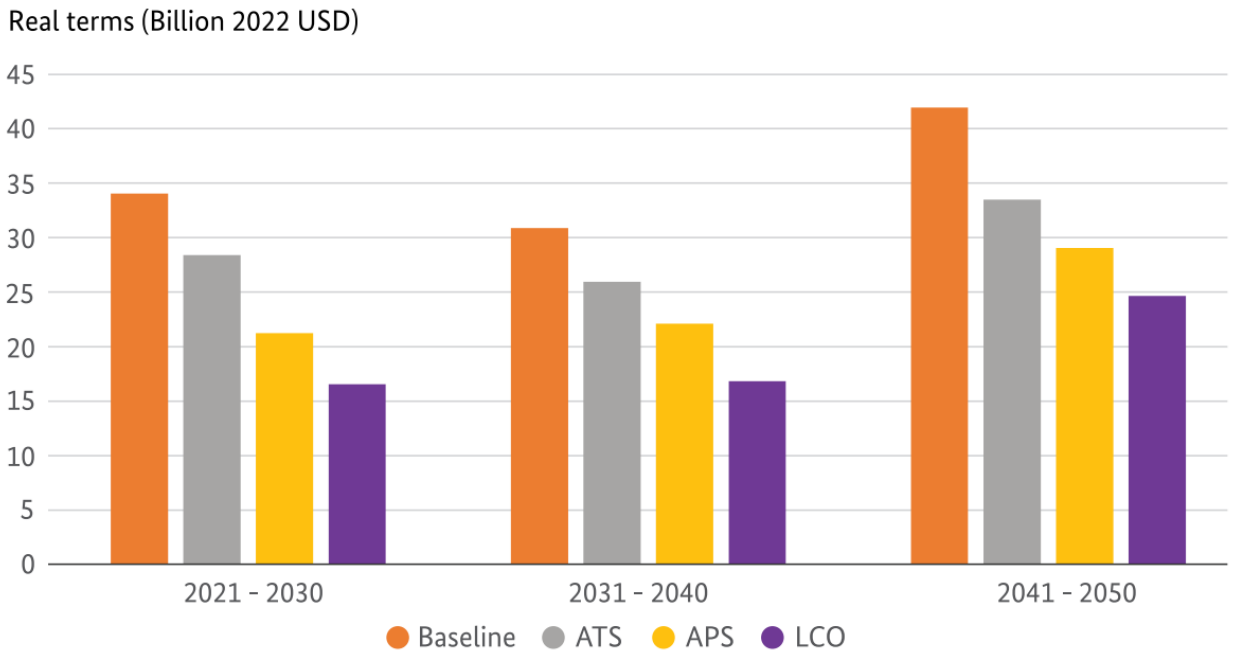


- As the need of installed capacity decrease due to energy efficiency, **clean energy penetrates the power system.**
- Even with the same level of electricity needed in APS, lower installed capacity is required in LCO Scenario. Coal, bioenergy, & nuclear replace natural gas, hydro, solar & wind.
- The **preference for nuclear was observed**: the high energy content of the nuclear fuel, offering lower costs for the electricity generated.

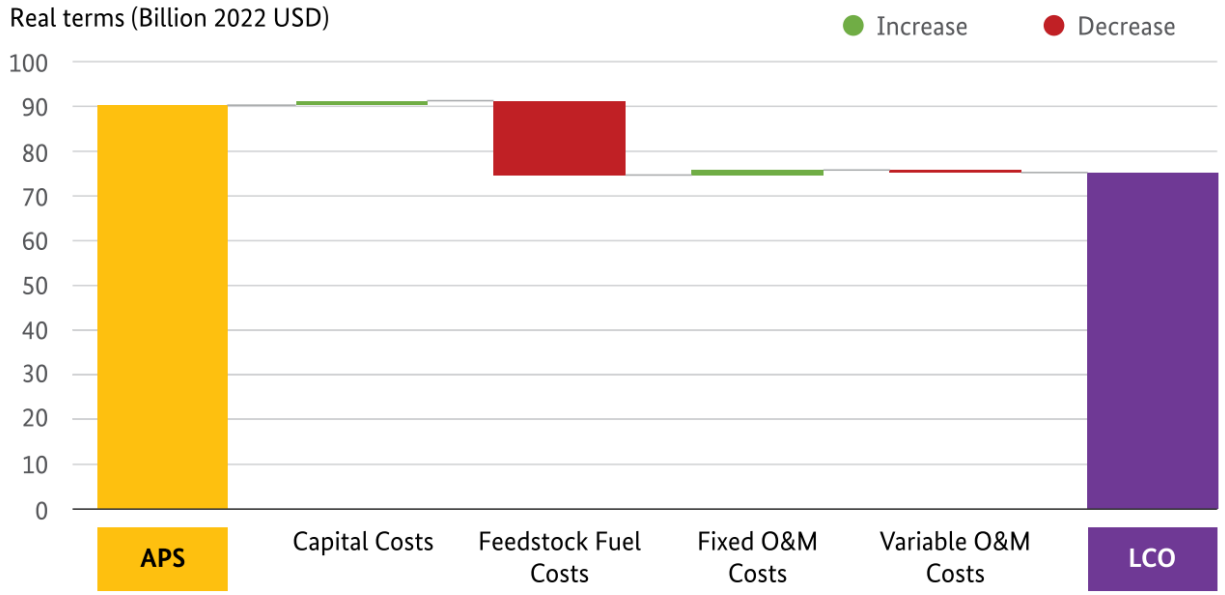
- In installed power capacity, continuing **national efforts would lead to the achievement of the regional target**, 37.9% of RE.
- In APS, 41.5% share can be achieved in 2025
- In the long term, a maximum of 63.2% RE share can be achieved in 2050. The LCO Scenario is set to maintain the regional targets.

Cost characteristics of power generation system

Annual Power Investment Cost



Power System Cost Shifting in 2025, APS vs LCO Scenario

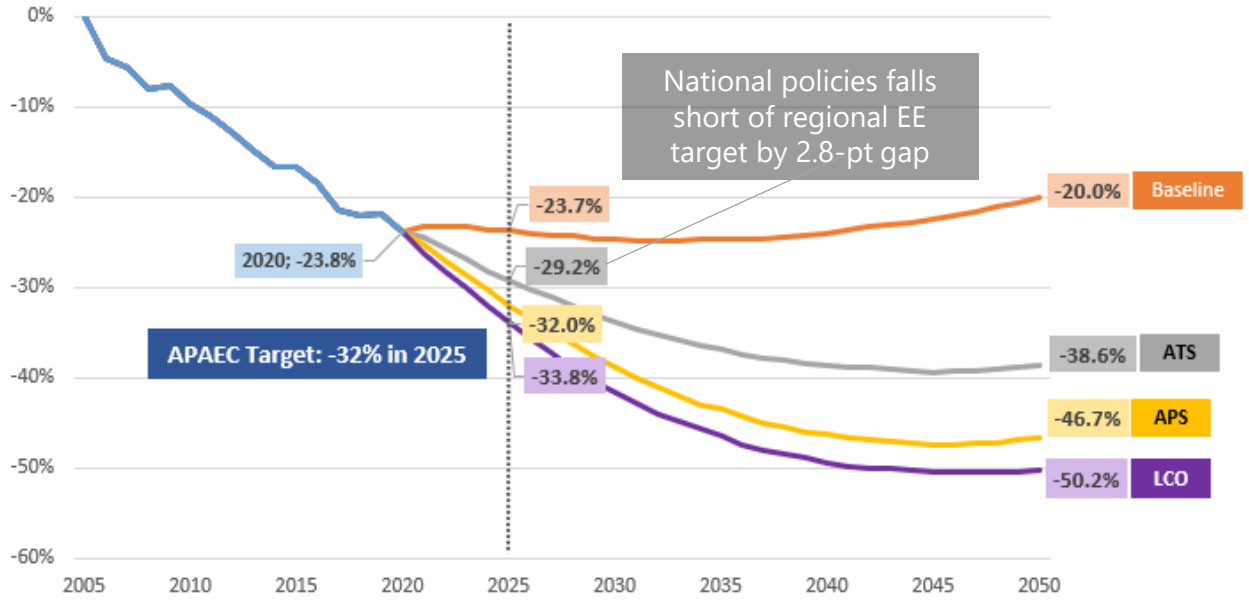


- The **power sector investment cost is strongly impacted by the energy efficiency measures by end-users**. The APS and LCO Scenario show the lowest power investment requirements in the later years, highlighting lower electricity demand.
- Cumulative investment in 2021-2050 (in Billion) – Baseline: USD 1,070; ATS: USD 879, APS: USD 726, LCO: USD 582.

- Throughout the projection period, **LCO Scenario cumulatively saves 80%, compared to APS**. Note that this is while keeping APAEC target of 23% RE share in TPES.
- Highest reduction in terms of production cost comes from the saving in fuel cost, followed by capital cost.

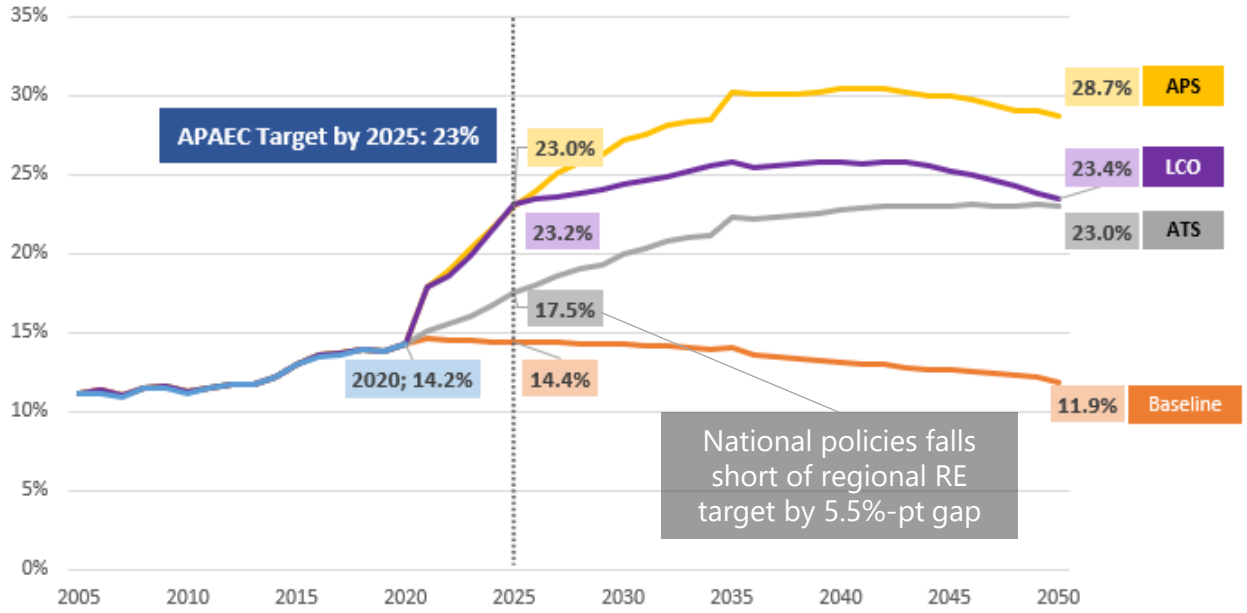
Progress and projections of APAEC EE and RE targets

AEO7 EE target monitoring across scenarios



- In 2020, **Energy Intensity (TPES/GDP) reduction** reached 23.8% based on 2005 level, due to the economic contraction caused by the pandemic. Even so, AMS is projected to not reach the 2025 target, with a 2.8%-point gap.
- With a cost-efficient power system in the LCO Scenario, a higher EI reduction can be achieved in 2050.

AEO7 RE target monitoring across scenarios



- Amidst increasing installed capacity, **RE share in TPES** reached 14.2% in 2020. The same trend of national policy would result in 17.5% of share in 2025, 5.5%-point shy of the aspirational target.
- Its progress slowed down in the future, requiring more innovative measures to increase RE, especially in end-use sector.

Potential for green job creation

Added Installed Capacities from 2020 level

2025 **41 GW** (ATS) | **51 GW** (APS)

2050 **255 GW** (ATS) | **311 GW** (APS)

Total RE Job Creation

2025

ATS	857 Thousand
APS	1 Million
LCO	960 Thousand

2050

ATS	4.5 Million
APS	5.5 Million
LCO	3.2 Million

Job addition dominated by Vietnam and Indonesia

	ATS	APS	LCO
VN	29%	31%	22%
ID	27%	27%	21%
Others	44%	42%	42%

(2050)

Hydro makes up the most RE jobs, followed by Solar

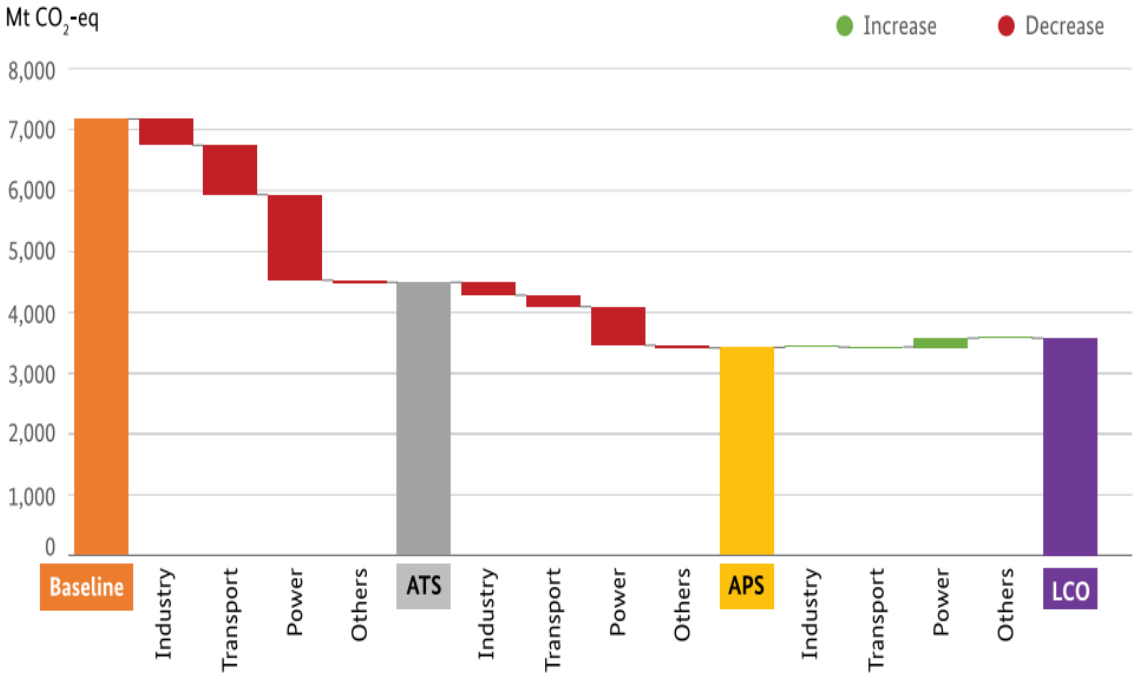
	ATS	APS	LCO
Hydro	3 Million	3.7 Million	2.5 Million
Solar	851 Thousand	1 Million	526 Thousand

(2050)

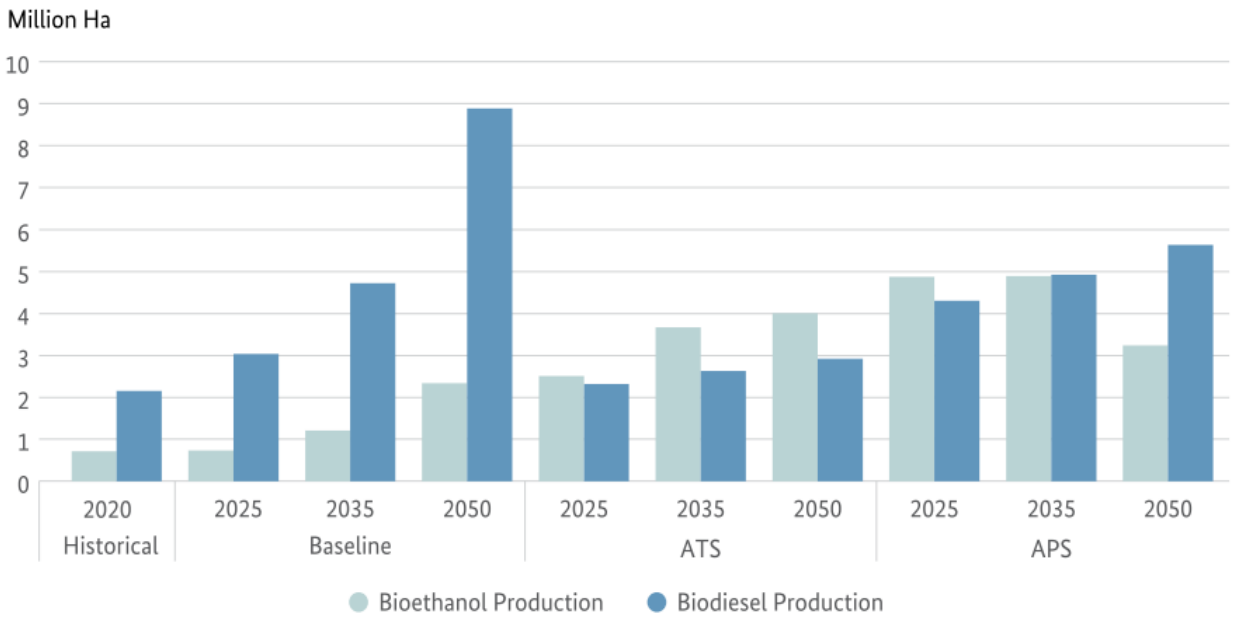
- Strong renewable deployment in the regional policies scenario (APS) is **projected to provide up to 5.5 million new jobs** in the construction, installation, operation and maintenance by 2050. About 67% of these would be involved in the hydropower plants, followed by 19% solar.

Intersectoral nexus: emissions and land use of biofuel

2050 ASEAN GHG Emissions



Land use for biofuel



Note: The LCO Scenario and APS have the same value.

- In 2050, the **annual GHG emissions** from the energy system would reach 6.7 Gt $CO_{2\text{-eq}}$ in Baseline Scenario.
- The amount is reduced along with energy transition, with more than half in APS, to 2.9 Gt $CO_{2\text{-eq}}$

- In 2050 Baseline Scenario, **8.8 million Ha of land is required** to produce biodiesel (oil palm) and 2.3 million Ha for bioethanol (sugarcane), or about 2.5% of the AMS land mass.
- Biodiesel reduces while bioethanol increases in ATS due to the energy efficiency measures reducing oil needs in transport.

Policy Recommendations

- Power and Supply – RE penetration should go beyond capacity, and translate to higher generation; All RE options should be optimized; For vRE, storage should be developed; Grid modernization and interconnection towards stability, flexibility, and resiliency is key; Securing energy should also consider geopolitics, materials availability, and reserve.

- End use sectors – Higher energy efficiency is a must (fuel economy, energy-efficient appliances), demand should be managed, electrification should be pursued (EV, cooking, etc.), and shift to more use of bioenergy (biofuel, biomass co-firing) and solar heating.

- Navigating secure and resilient energy transition should be the theme of the region energy system. All technology and policy options should be assessed in a comprehensive way, including efficiency, resource and materials availability, and end-of-life management.

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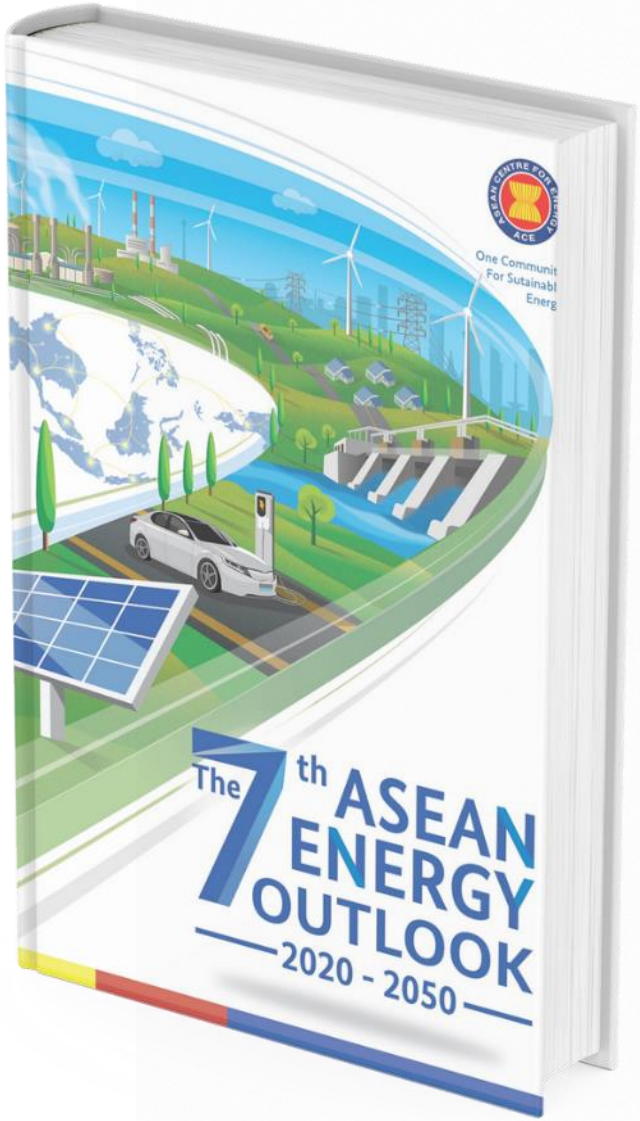

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Energy Investments in ASEAN

Research on Investments and Measures for Clean Energy and Power Sector Resilience in ASEAN

ENERGY FOUNDATION
能源基金会

Objectives

1. To assess the short-term measures and mobilising longer-term investments in clean energy and power sector resilience in ASEAN to reinforce ASEAN energy security.
2. To explore more mutually beneficial cooperation opportunities with international stakeholders.
3. To provide policy recommendations for ASEAN Member States to enhance the capability to attract clean investment for energy infrastructure and technologies, including short and long terms.
4. To formulate an integrated approach to green fiscal consolidations.

Status

A. Conducted two Focus Group Discussions on ASEAN Capacity Building Roadmap on Energy Investments with relevant stakeholders
   - 19 October 2022
   - 17 November 2022
B. Formulated ASEAN capacity building roadmap on energy investment
C. Developing the analysis in the form of:
   - Strategic Report
   - Policy Brief
   - International Journal
   - Op-Ed
D. Dissemination of the findings in a launching event (June 2023)

Thank You

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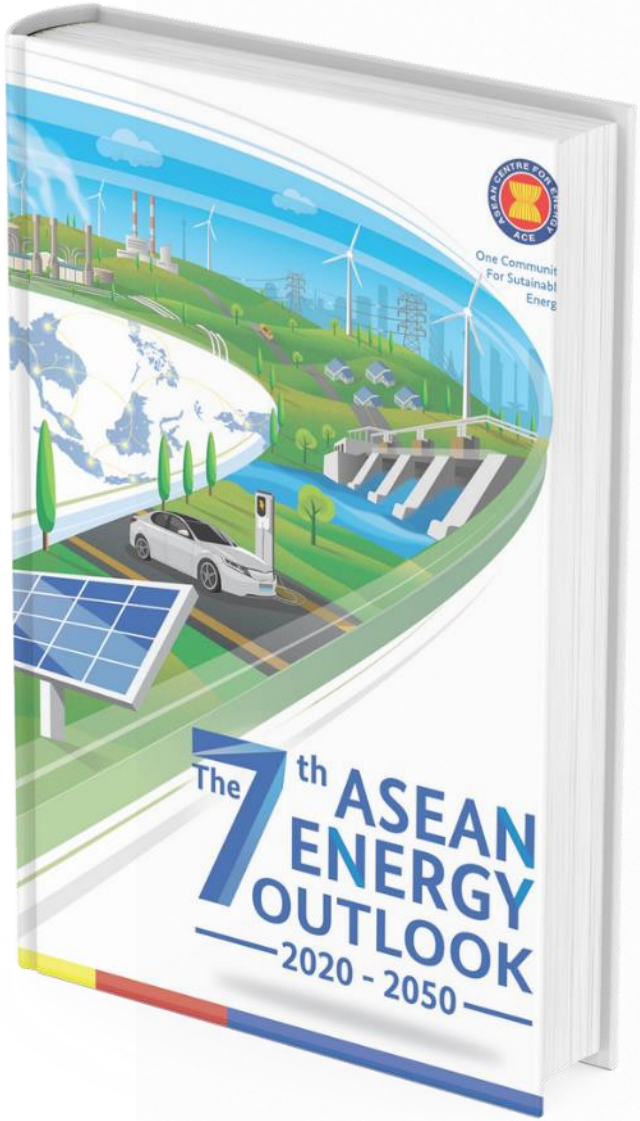

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