

Japan's Carbon-Neutral Scenario & Asia Energy Transition Initiative (AETI)

September, 2021

Japan's Carbon-Neutral Scenario

2050 Carbon-Neutral Declaration and 2030 Climate Goal

- In October 2020, Japan declared Carbon-Neutral by 2050.
- In April 2021, Japan announced <u>aiming to reduce its GHG emissions by 46</u> percent in FY 2030 from its FY 2013 levels, with continued strenuous <u>efforts toward 50 percent reduction</u>.



Strategic Energy Plan 1 - Overview-

 For achieving carbon neutrality in 2050 and a new reduction target for 2030, the 1st draft of the new Strategic Energy Plan was compiled in August.

<Basic Policy>

S+3Es (Safety + Energy Security + Economic Efficiency + Environment)

<u>~2030</u>

- > Massive introduction of renewable energy as the main energy source
- Thorough <u>energy efficiency</u>
- Restart of <u>nuclear power</u>
- R&D to accelerate <u>innovation</u>.

<u>2030~2050</u>

- Industry/ transport/ consumer sector -> use of hydrogen/ CCUS
- Implementation/scaling up of innovation such as hydrogen and CCUS/ Carbon Recycling.

Strategic Energy Plan 2 -Policy responses for 2030 -

 Main policy for 2030 is Renewable Energy, Energy Efficiency, and Nuclear Power in order to achieve 46% GHG emission reduction.



- Maximum introduction of renewable energy will be the top priority policy.
- Further pursuit of thorough energy efficiency
- Necessary scale of nuclear power will be continuously used on the premise of <u>safety</u>.
- Thermal power ratio representing power generation mix will be lowered as much as possible.
- Innovation in the thermal power, by means of hydrogen /ammonia -fired power generation and CCUS/Carbon Recycling will be pursued.

Green Growth Strategy -Roadmaps for 2050-

- In order to <u>realize CN 2050</u>, Japan has developed a <u>Green Growth</u> <u>Strategy</u> consisting of <u>R&D support, financial support, and regulatory</u> <u>reform.</u>
- The contents of this strategy will be used to <u>accelerate the energy</u> <u>transition in Asia.</u>

Overview

Ambitious goals (Roadmaps) to induce companies' investment and fully support the private sector's efforts

✓ Supported by Government's Finance, Tax incentives, Regulatory reform

- Action plans for 14 growing industrial sectors
- Green Innovation Fund (2 trillion yen)

Green Growth Strategy 2 -14 Growth Sectors-

Energy (1) Offshore wind, Solar, Geothermal Form domestic market of 30-45 GW by 2040, and develop floating technology for the expansion into Asia. Commercialization of new technologies such as perovskite (2) Hydrogen, Fuel Ammonia Combustion burner Expand bydrogen use as electric neuron fuels in addition to automobile

- Expand hydrogen use as electric power fuels in addition to automobile.
- Develop hydrogen power generation turbines

(3) Next generation Heat energy

Methanation, Utilization of Hydrogen

(4) Nuclear power

 Innovation for SMR (Small Modular Reactor), fast reactors, high-temperature gas-cooled reactors

Green Growth Strategy 3 -14 Growth Sectors-

Transport/Manufacturing	
 (5) Mobility and battery ♦ EV (electric vehicle), FCV (fuel cell vehicle), all-solid-state lithium batteries 	
 (6) Semiconductor and ICT Data centers, energy-saving semiconductors (demand-side efficiency) 	
 (7) Maritime ◆ Fuel-cell ships, electric propulsion ships, gas-fueled ships 	
 (8) Logistics, people flow and infrastructure Smart transportation, drones for logistics, fuel-cell construction machinery 	
 (9) Foods, agriculture, forestry and fisheries Smart-agriculture, wooden skyscrapers, blue carbon 	
(10) Aviation ♦ Hybrid electric, Hydrogen-powered, Aircraft	
(44) Caulaan Daaralkan Mataulal	

Concrete, biofuel, plastic materials

Home/ Office

- (12) Housing and building, Next generation energy management
- Commercialization of new technologies, distributed energy resources, microgrid

(13) Resource circulation

Biomaterials, recycled materials, waste power generation

(14) Lifestyle-related industry♦ Local decarbonization business

Asia Energy Transition Initiative (AETI)

Divestment from fossil fuels

- The World Bank and European financial institutions have announced their tough stance on fossil fuel financing.
- Asia Development Bank (ADB) is also planning to stop financing oil and natural gas field exploration, and coal-fired capacities.

	European Investment Bank The EU bank
2013: Stop financing coal 2019: Stop financing upstream oil and gas	2021: Stop funding oil, gas and coal projects at the end of 2021
2020: End to finance oil production with routine venting and flaring (burning excess gas)	Stop providing state export guarantees by; 2021: Dirty forms of oil such as shale 2025: Exploration & development of new oilfields 2035: Exploration & development of new gasfields

ADB DRAFT(as of August 16th)

- ADB will not support any natural gas exploration or dirilling activities, and will be selective in its support for midstream and downstream natural gas.
- Natural gas projects in all categories must meet all of the following conditions;
- i. No other low-carbon or zero-carbon technology, or combination thereof, can provide the same service at an equivalent or lower cost at a comparable scale.
- ii. The project's operating lifetime is consistent with the carbon stabilization trajectory aiming to achieve carbon neutrality by about 2050, or by a time set by DMCs that is consistent with their nationally determined contributions (NDCs). The project also avoids long-term lock-in into carbon infrastructure and the associated risk of creating stranded assets.
- iii. The project is economically viable considering the social cost of carbon and an operating lifetime consistent with (ii).

Global trend towards net-zero emissions



European Leaders argues Energy Leapfrogging

 Some European leaders insist that <u>developing countries could easily</u> achieve the carbon neutrality ("leapfrog" over fossil fuels), by means of installing renewable energies.



Frans Timmermans (European Commission Vice-President)



Francesco La Camera (Director-general for IRENA) [International Renewable Energy Agency]

IEA Net Zero Summit (March 31, 2021)

- The industrializing countries have a <u>"huge</u> potential" to leapfrog straight to clean energy from the fossil fuel-driven model.
- It's true that <u>hydrogen is expensive, but</u> <u>we can bring down the costs</u> by scaling up development, as economies of scale had brought down the cost of wind and solar, and would do the same for hydrogen.

Interview by Forbes (March 15, 2021)

- Oil, coal, and natural gas can play a role, but it is the worst option.
- The developing countries can leapfrog (over fossil fuels) and this has to be a common effort.



Growing energy demand in Southeast Asia

- According to IEA's stated policies scenario (STEPS), overall energy demand in Southeast Asia grows by 60% to 2040. Fossil fuels still represent approximately 80% of total energy demand in 2040.
- Similarly, overall electricity demand doubles in the next 20 years in the region. <u>The</u> <u>importance of fossil fuels remain unchanged, accounting for around 70% of total</u> <u>electricity consumption in 2040</u>.



<Primary energy demand in Southeast Asia>



<Share of electricity generation by technology

Source: IEA Southeast Asia Energy Outlook 2019

Growing energy demand in Southeast Asia

- In the Asia-Pacific region, **IEA expects that fossil fuels will still be an important source of supply**, even if a rapid shift to renewable energy occurs.
- Especially in Southeast Asia, where the access to electricity is still insufficient, the proportion of coal and natural gas will remain almost unchanged.



Renewable energy potentials in ASEAN countries

- In ASEAN countries, <u>renewable energy resource potentials are unevenly</u> <u>distributed</u>.
- There are only a limited number of regions where renewable energy can be introduced at low costs.

<Solar resource potentials in ASEAN countries>

<Wind resource potentials in ASEAN countries>





ASEAN+3 and EAS Summit in November 2020



Prime Minister Suga, participating in APT Summit(ref.) CABINET PUBLIC RELATIONS OFFICE

<Commitment for Asia> Japan will fully support realistic and sustainable decarbonsation and energy transition initiatives, which are suitable to current situation in Asia.

Chairman's Statement of the 23rd ASEAN+3 Summit

 We acknowledged the importance of realistic and pragmatic energy policy by utilising appropriate energy sources and technologies for achieving both goals of economic growth from COVID-19 pandemic and reducing emissions of greenhouse gases.

Joint Statement of the 17th ASEAN+3 Ministers on Energy Meeting

 The Ministers recognised that energy transition in ASEAN is focusing not only on shifting from fossil fuel to renewables, but also to affordable, reliable, and resilient cleaner energy options and technology towards post-pandemic recovery.

Joint Statement of the 14th East Asia Summit Energy Ministers Meeting

- The Ministers reiterated the importance of promoting the utilisation of liquefied natural gas (LNG) and development of infrastructure to support LNG markets in the region.
- The Ministers noted the conduct of the LNG Producer Consumer Web Conference 2020.

Roadmap towards carbon neutrality in Asia

 In order to attract foreign investment, it is essential for each Asian country to (1) declare to achieve carbon neutrality (not requiring its target year) and (2) draw its own roadmap towards carbon neutrality.

 \Rightarrow Japan will support the drafting of roadmaps in collaboration with ERIA.

 Japan will <u>support projects and activities designated in each country's roadmaps</u> towards carbon neutrality, and <u>present the new concept of "Asian version of</u> <u>Transition Finance"</u>.



Asia Energy Transition Initiative (AETI)

 Japan announced "<u>Asia Energy Transition Initiative (AETI)</u>", which includes a variety of support for the realisation of various and pragmatic energy transitions in Asia.

Asia Energy Transition Initiative (AETI)

- 1. Support for formulating energy transition roadmaps
- 2. Presentation and promotion of the concept of Asia Transition Finance
- 3. US\$10 billion financial support for renewable energy, energy efficiency, LNG, CCUS and other projects
- 4. Technology development and deployment, utilizing the achievement of Green Innovation fund

 (e.g.) Offshore wind, Fuel-ammonia, Hydrogen etc.
- 5. Human resource development, knowledge sharing and rule-making on decarbonisation technologies
 - Capacity building of decarbonisation technologies for 1,000 people in Asian countries
 - Workshops and Seminars on energy transitions
 - > Asia CCUS network



Announcement of AETI by Minister Kajiyama at Japan-ASEAN Business Week Opening Session

Energy Transition Technologies

 To support various and pragmatic energy transitions in Asia, Japan will support potential energy transition technologies as follows:

Renewable energy/ Energy efficiency

<Potential Technologies>

- O&M technologies related to grid stability (Supply-side).
- Energy management technology including storage batteries (Demand-side).
- Energy efficiency in industrial /transportation sector, and buildings.





Storage battery for grid stability DX in transportation sector

<Cooperative approach>

• Capacity building, Assistance for FS and/or demonstration, Financial support to each project etc.

Conversion to gas

<Potential Technologies>

Conversion to Gas (Coal to gas, Diesel to gas).



Gas turbine

<Cooperative approach>

 Capacity building, Assistance for FS and/or demonstration, Financial support to each project etc.

Co-firing of ammonia/hydrogen

<Potential Technologies>

• Co-firing or full-combustion of ammonia or hydrogen.



CCUS

<Potential Technologies>

CCS/CCU (Carbon recycling)

<Cooperative approach>

• Establishing Asia CCUS network etc.

Special Meeting of ASEAN Ministers on Energy and the Minister of Economy, Trade and Industry of Japan (Overview)

- On 21st June, the <u>Special Meeting of ASEAN Ministers on Energy and the Minister</u> of Economy, Trade and Industry of Japan was held via video conference.
- At the meeting, Minister Kajiyama emphasised that in order to achieve carbon neutrality throughout the world, it is important to steadily promote <u>realistic energy</u> <u>transitions that utilize a wide range of energy sources and technologies, and</u> <u>reflect different circumstances of each country</u>.
- Minister Kajiyama also proposed the <u>"Asia Energy Transition Initiative (AETI)"</u> as a Japan's comprehensive support measure for energy transitions in Asia.
- **ASEAN countries welcomed Japan's initiative**, and a joint statement which was adopted at the meeting, also included items of Japan's proposal.
- Japan will actively promote and share <u>the importance of steady implementation of</u> <u>energy transitions toward the realization of carbon neutrality and efforts to</u> <u>support such transitions</u> to the world through various opportunities.





Special Meeting of ASEAN Ministers on Energy and the Minister of Economy, Trade and Industry of Japan (Summary of Minister Kajiyama's Statement)

Minister Kajiyama's Statement at the meeting (Summary)

- Japan will actively promote the development of innovative technologies and their implementation in society to achieve carbon neutrality by 2050 and 2030 emission reduction targets. Japan will also <u>actively contribute to energy transitions and green</u> <u>growth in Asia</u>.
- Various and pragmatic energy transitions, which reflect different circumstances of each country and utilise all energy sources and technologies, are necessary to realise decarbonisation in Asia, where energy demand will continue to grow.
- As international pressure on fossil fuels intensifies, it is concerned that financing will not be available for the energy infrastructure, which plays an important role for economic growth in Asia. Therefore, in order to attract foreign investment, it is important for each country to declare to achieve carbon neutrality, and develop its own roadmap for its realization.
- Japan will support realistic energy transitions in Asia, which reflect different circumstances of each country, through <u>"Asia Energy Transition Initiative (AETI)".</u>
- It is necessary to <u>actively introduce and share idea and efforts for energy</u> <u>transitions in Asia to the world</u>. The meeting is a starting point to spread these ideas and efforts to the world on the occasion of various international conferences such as ASEAN summit, the G20 and COP26.
- Japan will hold the <u>Asia Green Growth Partnership Ministerial Meeting in October</u>, planning to invite ministers from Asian countries including ASEAN, the U.S., Canada, Australia, Middle Eastern countries and others to the meeting.

Special Meeting of ASEAN Ministers on Energy and the Minister of Economy, Trade and Industry of Japan (Joint Statement)

Joint Statement (Outline)

"Enhancing Partnerships in Realising Energy Transitions in ASEAN"

- 1. The Meeting welcomed **further collaboration between ASEAN and Japan**, including with **the Economic Research Institute for ASEAN and East Asia (ERIA)**.
- 2. The Meeting recognized that the ASEAN Member States are at various stages of economic development and differing geographical conditions, in order for the realisation of energy transitions.
- 3. The Meeting noted **the unique energy policies of each country**, which address energy security, economic competitiveness and environmental sustainability based on each country's circumstances.
- 4. The Meeting recognized <u>the energy transition strategies</u>, including but not limited to the expansion of multilateral power trading, development of common ASEAN gas market, the Clean Coal technology (CCT), CCUS, energy efficiency, renewable energy, acceleration of regional energy policy, and nuclear.
- 5. The Meeting noted the need to improve <u>the utilisation of all energy sources, technologies,</u> <u>information, expertise, and related policies</u> to meet the growing energy demand in ASEAN.
- 6. The Meeting affirmed the necessity of adequate financing to support the realisation of energy transitions in the region. The Meeting welcomed Japan's "Asia Energy Transition Initiative (AETI)", which includes a wide range of support for energy transitions in ASEAN, such as the proposed Asia CCUS Network, and studying the details of the Asia Energy Transition Finance concept.
- 7. The Meeting noted Japan's initiative to convene the **Asia Green Growth Partnership Ministerial Meeting** in October 2021.

Schedule



- In October 4th, Japan will hold the <u>Asia Green Growth Partnership</u> <u>Ministerial Meeting (AGGPM)</u>, planning to invite ministers from Asian countries including ASEAN members, the US, Canada, Australia, Middle Eastern countries and others, which share the importance of realistic energy transitions.
- Japan will also share the outcomes of the meetings to the G20, COP26 and other related international conferences.

Jun.	21 st	Special Meeting of ASEAN Ministers on Energy and METI Minister of Japan
Jul.	23 rd	G20 Energy Ministers Meeting
Sep.	13 th -16 th	ASEAN Energy Ministers Meeting (AMEM Week)
	21 st -27 th	UN General Assembly
Oct.	4 th	Asia Green Growth Partnership Ministerial Meeting (AGGPM)
	26 th -28 th	ASEAN Summit
	30 th -31 st	G20 Summit
Nov.	1 st -12 th	COP26 Expanding Partnership